SHIPBUILDERS AND NEUTRAL ORDERS. See p. 412.
300 TON FERRO-CONCRETE BARGE (Drawings). See p. 420.

10/18

SHIPBUILDING AND SHIPPING RECORD

A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

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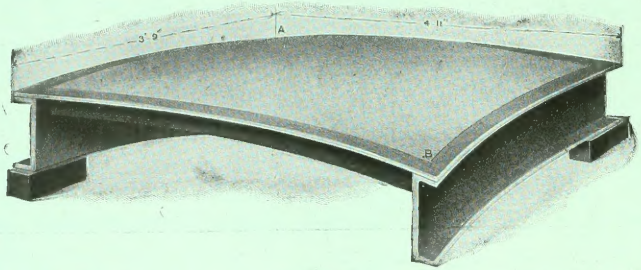

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MR. LLOYD GEORGE on Monday, paid a very lofty tribute to the courage and endurance of the merchant service during the war. The terms of the resolution of thanks which he submitted to the House of Commons contained these words, "That the thanks of this House be accorded to the officers and men of the mercantile marine for the devotion to duty with which they have continued to carry on the vital supplies to the Allies through seas infested with deadly perils." This passage followed immediately after the expression of thanks to the Navy and the Army for their sacrificing courage and steadfastness. The Prime Minister rose to several lofty flights of eloquence as he spoke of the triumphs of the two services. He emphasised the readiness with which the merchant service has braved without flinching the perils of war. Special recognition ought to be accorded to its officers and men. "It is a great distinction," he observed, "for any civilian body of men to be placed in the same category as the soldiers of the British Army and the sailors of the British Navy. But the officers and men of the British mercantile marine have won that distinction." It is only just that such a tribute should be paid to these men by the Prime Minister. The words in his mouth in the House of Commons are spoken on behalf of Parliament, and of the nation. His acknowledgment of the silent increasing services of the Navy was also framed in vivid language. As he said, we take it for granted, and yet it is the anchor of the Allied cause.

Great Tribute to Merchant Service.

Merchant seamen, in common with soldiers and sailors, are now, under the Representation of the People Bill, to be given the privilege of voting at Parliamentary elections not only by post as absent voters, but also by proxy. This arrangement is strictly limited to the duration of the war and the succeeding twelve months' A scheme of this sort is necessary if the men who are fighting the nation's battles overseas are to exercise the Parliamentary franchise. Having assented to this principle for the Army and Navy, Parliament could not ignore the position of the mercantile marine. But a difference exists between the two cases. The pressing need for this expedient for the Army is only temporary. The merchant seaman must continue in the main to be an absent voter, but the last word has evidently not been said on the subject. Some members are inclined to favour a special constituency for the merchant service, as proxy voting is manifestly open to abuse. The House of Commons has, however, wisely limited to two the number of proxies which may be held by any one person, except in the case of near relationship. Without this restriction it would have been possible for a trade union "boss" to possess himself of scores of proxies, and the spectacle of his extorting terms from a timorous candidate would have been an outrage on electoral decency. It would be a pity if votes for merchant seamen merely operated to convert other people into plural voters.

Votes of Merchant Seamen.

Recent advices from Norway indicate that the insurance market there has recently awakened to the fact that business, conducted on a pre-war basis, was becoming unprofitable. To meet this state of affairs some changes have been introduced in the conditions on which Norwegian steamers are insured. The principal alteration is more of a financial measure than an underwriting one, being a reduction of the rebate or discount allowed to the assured on the gross premium. This allowance used to be 10 per cent., but it is now reduced to 5 per cent., a change which will bring a considerable addition to underwriters' premium income with it. It is of interest here to compare the reduction of discount on deferred premiums—recently instituted between brokers and underwriters in this country—which is a measure of the same nature, though far less drastic in its action. The underwriting changes of the Norwegian market deal principally with premiums on vessels lost by war perils, to which we refer in the succeeding note, and with the raising of premiums. On modern vessels under first-class management, the minimum rate has been put up from 6 per cent. to 6¾ per cent., an advance slightly in excess of the 10 per cent. rise obtained by the British market. Other premiums are up proportionately, with an extra advance in the rates for vessels over seven years old. Insured values are, of course, tremendous; an authentic estimate of the increase on pre-war values puts the present figure at ten times greater than the standard of 1914.

Norwegian Insurance Conditions.

Underwriters in Norway, having no *Easby Abbey* judgment in their code, have been returning the premium on marine insurances to owners whose vessels have been sunk by war perils. This is, indeed, a common practice in other countries, and the full *pro rata* daily rate has, until recently, been allowed by the Norwegian market. We have indicated, in the preceding note, that this market has been making changes for the betterment of underwriting conditions, and not the least of these is a decision which has been made to return only one-third of the premium for the unexpired time of a marine risk policy when the vessel insured has been lost by a war risk. The retention of two-thirds of these premiums should go far towards ameliorating the position of the Norwegian underwriters, and although owners are, naturally, not greatly pleased with the change, they are accepting it with good grace. Moreover, the apparent harshness of the new

Returns on War Losses.

condition is somewhat softened by the fact that it is possible to insure the marine premiums against war risk, and *vice versa*. With regard to the British market, the change will not have much effect. Norwegian risks reach this country largely in the form of re-insurances, but, wherever possible, underwriters in London have accepted such risks with the added condition of the retention of premiums on war losses, in accordance with the general custom of the market.

Facts for the Public.

The Newcastle resolution, which incidentally directed attention to the Norwegian ordering of ships on the North East Coast, has served a useful purpose which, it is to be hoped, shipowners elsewhere in the United Kingdom will follow up. It has given the general public, which is notoriously ill-informed regarding shipping affairs, a gripping idea of the grave position into which British shipowners are being driven by the short-sightedness of the Government. British shipping is, to put the matter in a nutshell, being left financially unable to compete after the war with neutral shipowners. In other words, owners cannot, out of their permitted profits—where there are any—pay the prices for new tonnage which neutrals are not only willing, but eager, as these North East Coast transactions show, to pay. It is a long step forward in the direction of the publicity campaign, which we advocate, to have brought that fact prominently before the public. The matter should not, however, be allowed to rest there. It is comparatively easy for people, who thoughtlessly blame all shipowners for "profiteering," to get out isolated figures which support their peculiar views. The public sees these alleged facts, but knows nothing of the contexts from which they have been torn. Obviously, the rejoinder of shipowners ought to be the preparation and circulation of complete sets of actual figures showing exactly what the position is. The Government will do nothing except under the pressure of public opinion; of that shipowners ought to be by now absolutely convinced.

Austrian Shipping Problems.

The whole field of Austrian shipping problems is discussed at some length by Leopold von Chlumecky in a recent issue of the *Oesterreichischer Rundschau*. The writer is of opinion that the Austrian mercantile marine will undoubtedly be in a difficult position after the war. Capital resources of foreign competitors have increased enormously, and Austrian material is old and inadequately written down. Freights will decrease directly building costs and working expenses become lower, and the great reserves, on which foreign competitors can draw will hasten the decrease of freights. Depreciation of exchange will also throw a heavy burden on Austrian owners. The time to establish Austrian shipping as a great and independent branch of national economics will be directly after the war, and if that opportunity be neglected it will not recur. Chlumecky concludes that from a purely commercial standpoint there will be little incentive to increase the merchant fleet; on the contrary, there will be a great temptation to sell vessels immediately after the war, but to do so would be to acquire the temporary benefit of the proceeds of sale at the cost of permanent injury to national interests. The improvement of national credit by reducing freight payments to foreign shipowners is alone a weighty reason for maintaining the Austrian merchant fleet.

Canada and State Ownership.

The other week, in the course of a brief reference to the recommendations of the Canadian Special Trade Commission to Great Britain, France and Italy, we indicated that for some time the Ottawa authorities had been credited with an ambition to own cargo boats, and that it would cause no surprise if advantage were taken of the findings to emphasise the urgency of the matter, in view of probable post-war developments. The full report, which is now before us, is certainly much more definite on the point than we had thought it to be. It complains that the established lines have not given that service in linking-up the Dominion with other countries which might have been expected, and urges that the question is one of such serious importance to the country as to call for prompt and scientific treatment by the Government. Canada's ocean transport facilities will, it adds, have to be reorganised completely if the Dominion is to derive the fullest benefit from her natural resources and manufactured products. One of the suggestions made in this connection is that Imperial control of cargo tonnage, centralised in London, might so adjust the employment of ships that the different needs of the Empire might be met as the requirements of the crop or season demanded. The Commissioners, moreover, believe that the question is too important to be left to the decision of private companies. Now, as it happens, there are people in this country, some of them not unknown to high office, who have expressed a similar opinion and who strongly favour State control of the shipping industry for a number of years after the war, with a view, doubtless, to ultimate nationalisation. The risk of such a policy being adopted is, in fact, by no means remote, and it is, therefore, much to be hoped that the interests concerned will take energetic action before it is too late.

Restraint of Princes.

Another important point in regard to a "restraint of princes" clause in a policy of marine insurance has been finally settled by the House of Lords in the case of Becker, Gray & Co. *v.* the London Assurance Corporation, and the decision of the Court of Appeal has been upheld. Bales of jute which at the relevant times were the property of British owners were carried by the German ship *Kattenturm* at the moment the war broke out. Her master interrupted the voyage which was for Hamburg, and put into the neutral port of Messina. The cargo owners thereupon made a claim on the underwriters on the basis of a constructive total loss under the restraint of princes clause. The underwriters have successfully maintained that it did not operate to make them liable. As Lord Sumner said, it was self-restraint and not restraint of princes that hindered the master of the *Kattenturm* from putting to sea. He went into Messina to avoid a peril and not under the stress of an actual peril. Sanday's case was cited in connection with these proceedings, but the House of Lords found that there was a clear distinction. There was no illegality at English law in the master of a German ship continuing his voyage to Hamburg on the outbreak of war. But with a British ship it was different. The prosecution of the voyage of the British ship to a German port was illegal and was terminated by an Act of State. That feature was absent entirely from the present case.

New Wages Claims.

Judging from the increases of wages which are desired by both engineering and shipbuilding skilled workers, the opinion still prevails in Labour circles that Trade Unionists who are engaged on "munitions" ought not to suffer any of the economic inconveniences of the war. The claim is that they ought to have their wages advanced sufficiently to meet the whole increase in the cost of living, and it is made plain that another award like the last one of 3s. a week will be resented. Why "munition" workers should not suffer to the same extent as the thousands of other workers who have had no war bonuses, is not easy to see. But the precedent of co-relating wages and the cost of living having been set up by the State, all argument along that line is futile. Having conceded that something partially to compensate the greater cost of food and other human necessities is the right of war workers, the State cannot logically, it is contended, stop at half-measures. It must give the full measure. There is, of course, nothing really new in this uncompromising attitude of Labour. Labour is always uncompromising when it is abnormally in demand. How far it will carry its insistence in this

instance remains to be seen; but in the public interest it is to be hoped that the State will be firm, but fair—fair, not only to the workers, but also to their employers. Usually, it is assumed that these war-wages awards are to cease to have effect when the hostilities come to an end. Unfortunately, it is only the public who are under that impression. The Trade Unions make no secret of their intention to carry the high war wages over into the days of peace. The effect of that on post-war shipbuilding and engineering may very easily be disastrous.

British Shipbuilding's Future.

As shipbuilding is an organised industry in the sense of the Reconstruction Sub-Committee's report, it may be taken for granted that the Employers' Federation and the trade unions will make an effort to set up a system of National, District, and Works Councils. Whether they succeed or fail in doing so will largely depend, however, on the Trade Unions. According to Mr. Roberts, the Government trust that employers and workpeople will approach the problems of reconstruction—"not as two opposing forces, each bent on getting as much and giving as little as can be contrived, but as forces having a common interest in working together for the welfare of their industry." It is the general hope that they will do so, although everybody is not so optimistic about it as some politicians appear to be. The General Secretary of the Boilermakers' Society is cited by the pessimists in justification of their doubts. Addressing a meeting at Blyth the other evening he expressed the belief that in the very near future they would succeed in forming a combination of trade unions which would dominate the shipbuilding industry in a way that had never been done in the past. The statement is very disquieting, for in pre-war days British shipbuilding's most serious trouble was domination by the trade unions. In order to live after the war in international competition, the process of shipbuilding will practically have to be reorganised, and it can only be satisfactorily reorganised with the co-operation of the trade unions. It would be a relief to know whether Mr. Hill really means what he says, for with accentuated trade-union domination there would soon be no British shipbuilding to dominate.

Japanese Shipbuilding Development.

We have received from the London manager of the Japanese Shipping Company known as the Mitsubishi Goshi Kaisha a communication stating that in consequence of the magnitude of the business now carried on by the shipbuilding and engineering department of the company, and in view of its future expansion it has been found necessary to alter the method of control, and therefore this department which includes three dockyards at Nagasaki, Kobe, and Hikoshima will shortly be formed into a separate company. The title of the new company is to be the Mitsubishi Zosen Kaisha (The Mitsubishi Shipbuilding Co., Ltd.), and the subscribed capital 50,000,000 yen (£5,000,000), with paid up capital 20,000,000 yen. Although nominally a joint stock company, as a matter of fact all the shares are owned by the Barons Iwasaki. Baron Koyata Iwasaki will be the president, and the concern remains an integral part of the Mitsubishi Goshi Kaisha, the alteration being made merely to facilitate business and to encourage initiative. Whilst no doubt the shipbuilding department of the company has been developed considerably during the war, it is of interest to note that the Nagasaki yard had before the war an output of 50,000 tons and the engine shops a capacity of 70,000 i.h.p., and the Kobe yard a capacity of 25,000 tons, and the engine shops a capacity of 35,000 i.h.p. The company has built a number of warships, including a battle-cruiser of over 27,000 tons displacement, and a great many liners, including vessels of over 13,000 tons for the leading Japanese shipping companies. It may be assumed that it has been very active indeed during the war in producing new tonnage, and that the reconstruction denotes still further activity both now and after the war.

Training of Engineers.

Within the last few months, we have frequently drawn attention to various schemes which have been drawn up by various marine engineering and shipbuilding institutions dealing with the subject of the education and the training of engineers. The number of different schemes brought forward was indicative not only of the importance of the subject, but also of the desire on the part of engineers and shipbuilders to solve it. Whilst, however, these schemes had many essential points in common they likewise had many points of difference, and there was more than a likelihood that in the multiplicity of counsellors we should fail to arrive at a definite scheme which could be immediately put into operation. It was obviously necessary that an attempt should be made to co-ordinate the various schemes put forward, and we therefore welcome the proposal which received such unanimous support at the meeting (a report of which appears on page 414), held on Thursday last to establish a central organisation for the better co-ordination of engineering training. A committee has been formed representative of the various interests concerned, *i.e.*, professional, manufacturing and educational, and with the numerous proposals which have already been drawn up before them, they should very soon be in a position to publish their report. As Sir John Wolfe-Barry said, it is necessary to provide the necessary training on the technical side for the rank and file of the industrial army. He believed we could produce such an army second to none in the world, and for reasons which were fairly obvious, the work would have to be done. To which we would add—and be done soon.

Corrosive Gases in Feed Water.

It has been proved by numerous experimental researches that one of the chief causes of boiler corrosion is the presence of gases in the feed water. Whilst oil in the feed water is known to have a very bad effect on the plates, tubes, and furnaces of a boiler, it is not so well known that air and carbonic acid gas also have a very deleterious effect. The elimination of these corrosive gases is one of the most important advantages which follows the adoption of a proper system of feed-water heating; in fact, this function of the feed-water heater is of as great importance in its effect on the boilers as the increase of efficiency which results from the utilisation of hot feed. The liberation of dissolved gases does not occur in so marked a degree with heaters which are installed on the discharge side of the feed pump, but with the heater of the direct contact type placed on the suction side of the feed pump, the pressure in the heater is generally much less than that of the entering water, and the effect of the lowering of the pressure and the sudden heating of the water is to liberate the air and other dissolved gases, and these are usually removed to the condenser or to the atmosphere by a small cock, situated in the air vessel at the top of the heater.

Mechanical Stokers.

In land boilers with which steady and regular steaming is generally required, the adoption of mechanical stokers has proved of considerable advantage in fuel economy. The utility of these stokers lies primarily in the fact that the fuel can be fed to the furnaces continuously, without opening of furnace doors with the deleterious effect of inrushes of cold air to the furnace. The rate of charging can be regulated to suit the amount of fuel being used, and practically complete combustion of the fuel gases can be obtained. In marine work, however, the conditions existing are somewhat different from land practice, the variable demands for steam met with, and the unreliability of mechanical stokers in rough weather has neutralised any gain that might be obtained, in escaping the troubles and losses incurred in efficiency due to indifferent firing

by hand. With moderate degrees of firing under natural draught, the feeding of a uniform quantity of fuel to all parts of the grate presents no serious difficulties, but in cases of hard steaming, as is met with in marine service under forced draught, and the tendency of the fires to burn more rapidly in the centre makes the regulation somewhat more difficult. Experiments of the future may overcome these difficulties and make possible the construction of a marine stoker giving the advantages obtained by their use in land practice.

SHIPBUILDERS AND NEUTRAL ORDERS.

THE fact that some British shipbuilding firms have made, and that others have declined—so the newspapers say, at any rate—to make contracts for new vessels with certain neutral owners, unquestionably disturbs the public mind. The man in the street has not yet drawn any very definite conclusions from it, but in the absence of an official statement as to the industry's position his disposition unmistakably is to draw an unfavourable one. These North East Coast concerns must, he argues, be lacking in patriotism, for (1) Newcastle's shipowners are making a song about their conduct, and (2) West Coast concerns have declined business of the same character and from the same quarter. Accordingly, there are murmurs to the effect that shipowners are not the only capitalists who are prepared to sink patriotism in order to make money; and before long there may be a regular popular clamour for the taking over by the State in the interest of the community of the whole shipbuilding industry.

To the average outsider, the situation is admittedly not very clear, and for its comparative obscurity the shipbuilding industry is in a measure itself to blame. The Shipbuilding Employers' Federation could clear the matter up in a few lines if it chose to do so. As it does not choose, its members cannot complain if we, with less knowledge and authority, endeavour to do so. No question of patriotism is involved. West Coast firms, as well as East Coast firms, could fill their books to-morrow with neutral contracts for post-war delivery without justifying any charge of unpatriotic conduct, simply because the clearest fact of the whole matter to everybody in the business is that no new British-built vessel will be allowed to go to a neutral owner until the Government is satisfied that our own supply of tonnage is adequate. Public condemnation of East Coast firms which have taken Norwegian contracts, and praise of West Coast firms which have refused them has, therefore, absolutely nothing to justify it.

Nor is there a great deal—some people would say there is nothing at all—to be said in support of the allegation that Newcastle's shipowners resent the booking of these orders by British shipbuilders. In directing attention to the contracts, their idea was obviously less to complain about the shipbuilders' exercise of his perfect right to look after himself than it was to illustrate the hopeless position into which British shipping is being forced by the short-sighted financial policy of the Government. The prices which the Norwegians agree to pay are, in effect, the post-war market prices. British owners, with their profits limited to the pre-war standard, cannot pay post-war market prices. In other words, in order to be able to compete after the war with neutral owners British owners ask to be allowed to retain at any rate as large a proportion of profits as their rivals are allowed to retain. British shipowners have no grievance against British shipbuilders.

So far, no British shipbuilder, or organised body of British shipbuilders, has indicated whether he, or it, agrees or disagrees with the shipowners' contention. There is no doubt in anybody's mind, however, that the shipbuilding industry is—both directly and indirectly—prospectively seriously affected by the Government's financial policy of limiting the profits of industry. A great many ships will have to be built by somebody; that is a fact which even a politician will not seek to deny. It may be said that the State is not building ships. The State certainly is building ships of a kind, and its hope is that at some future indefinite date it will sell them to shipowners at profitable—to be exact, market—prices. But if owners cannot pay the market prices for ships of their own ordering, they obviously cannot pay the market prices for standardised ships. The root of the trouble is the present excessive burdens of taxation which shipping is being made to bear, and until it is removed British shipping will continue in a highly dangerous position.

The danger to the shipbuilding industry lies in the fact that in draining shipping of its capital—for that is what the process amounts to—the Government may create a position which will call for an indefinite prolongation of its present inefficient and highly expensive control of the yards. The State may, that is to say, continue, in order to minimise the effects of its great blunder, to employ "in the national interest," fixed and other capital which belongs to individual private citizens. During the war no shipbuilder has objected to put all he had at the disposal of the State. Nor, if the need arose to use his resources in the national interest after the war, would any be found seriously to object.

Shipbuilders will, however, be perfectly entitled to object to a prolongation of the control brought about by the State's own mistaken action, and it is to be expected that they will object. Two years of further control—two years after the end of the war, that is—would probably ruin the industry. Three certainly would, for in that time rival foreign industries, working in free markets, and without any limitation of their profits, would be able to expand to a dangerous extent. Frankly, we think that the time has arrived for an overhaul of the Government's financial policy so far as shipping and shipbuilding are concerned, for nothing is clearer than that, as things are going, the State itself will be the greatest stumbling block to reconstruction.

DISCHARGE OF SHIPS, AND FACTORY REGULATIONS.

A DECISION of the House of Lords given on Monday fixes clearly and judicially upon shipowners a very wide responsibility in complying with regulations made by the Home Secretary under the Factory and Workshops Act regarding means of access to ships for persons employed in the process of loading or unloading even when stevedores are engaged by consignees of the cargo. Some considerable doubt has arisen since recent judgments of the Irish Courts, whether the statute authorising these regulations for factories and workshops permitted them to be applied to the owners of ships in regard to work connected with the loading or discharging of vessels. A ship is not a factory. These doubts have been removed and the regulations made by the Home Secretary are now declared to be valid and applicable. Let us see what the regulations are, and their applicability to the case under review where the point at issue was compensation under the Fatal Accidents Act on account of a man who had lost his life in proceeding on board a ship for the purpose of taking part in unloading the cargo.

Regulations made in 1904 by the Home Secretary under the Factory and Workshops Act, 1901, throw upon "the owner master or officer in charge of a ship" the duty of complying with certain of them. One of these proceeds: "If a ship is lying at a wharf or quay for the purpose of loading or unloading or coaling, there shall be means of access for the use of persons employed at such times as they have to pass from the ship to the shore or from the shore to the ship as follows: (*a*) where a gangway is reasonably practicable, a gangway not less than 22 in. wide, properly secured and fenced throughout on each side to a clear height of 2 ft. 9 in. by means of upper and lower rails, taut ropes or chains, or by other equally safe means; (*b*) in other cases a secure ladder of adequate length. Provided that nothing in this regulation shall be held to apply to cargo stages or cargo gangways, if other proper means of

access is provided in conformity with these regulations." The question arose whether the Home Secretary really had the power to place this obligation on the "owner, master or officer of a ship." It is a matter of construing Acts of Parliament, and the fact that judicial opinion has been divided very emphatically on the subject indicates that the question is hedged with many thorny technicalities.

On the one side it was contended that the Secretary of State had under the Act power only to prescribe what processes should be followed, but not to say by whom the necessary machinery was to be provided. "The person whose liability is here in debate is the shipowner," said Lord Wrenbury, one of the minority in the House of Lords. "He was not engaged by himself, his agents or workmen in the process. The exact question for decision is this. Does the Act give the Secretary of State jurisdiction to make a regulation binding upon a person who is neither owner of the factory, nor occupier of the factory, nor employed in the factory, a person who in fact has nothing to do with the factory and is not carrying on the manufacturing process? I think not." Against that view the Lord Chancellor and the majority held that it was obviously expedient, if not necessary, that regulations dealing with the case of loading and unloading ships should not merely provide for the use of the gangway, but should say by whom it was to be supplied. Their opinion was that it was in itself highly reasonable that the owner of the ship should be selected as the person to have a gangway ready for such purposes, and moreover through his servants to have it properly put up for use. It was quite within the power of the Secretary of State in carrying out the statute to put this duty by regulation on the owner. That, therefore, settles the validity of the regulation. See how it works out in this particular case.

A vessel named the *Aletta*, belonging to James Henry Monks (Preston), Limited, was lying in the river at Waterford at a wharf. The consignees of the cargo employed a stevedore to discharge it. He in turn hired dock labourers and a ladder was used as a means of access to the ship. According to the verdict of a jury one of these men in crossing the ladder fell into the water and was drowned. It was stated at the time that the ladder was, owing to the state of the tide in a horizontal position. Note the parties that intervened between the shipowner on the one hand and the unfortunate man who had lost his life on the other. Nevertheless, the father of the man brought an action under the Fatal Accidents Act against the shipowners to recover damages. The ground on which the action was based was the allegation that the owners had neglected to provide proper means of access to the vessel in accordance with the regulations in respect to the loading and unloading of vessels. In the first instance a jury assessed the damages at £270, but the Irish Courts set the verdict aside on the ground that the regulations were invalid and there had been no neglect in not complying with them. But by a majority of three to two the House of Lords decided that the regulations were binding and accordingly the verdict was restored. When people know exactly how they stand in these matters they can act accordingly. One may have sympathy with Lord Wrenbury's line of reasoning, but the view of the majority is the law.

SHALLOW-WATER EFFECTS.

At the present time it is not always expedient to run the trials of new vessels over recognised deep-water courses, with the result that some ships are being run in waters which are really too shallow to afford any reliable information as to their capabilities. For example, instead of having a depth of water of over 40 fathoms in which to make their trials, in some districts the depth available in the restricted areas is considerably less than half that stated above. Even for slow, full ships this depth is insufficient to obviate the disturbing influences which come into play, especially if these vessels are being run at their deep load draught. When the ships being tried are of high speed, the necessity for deep water becomes the more imperative, and it is not to be wondered at that results inconsistent with former experience and expectations are being obtained on unrecognised courses.

The peculiar effects of shallow water on speed performances have been the cause of interesting investigations and experiments. The first recorded incident of its appearance and effect, as far as the writer is aware, is recorded in the Transactions of the Royal Society of Edinburgh, 1840. In this volume, Scott Russell says that a spirited horse attached to the boat of William Houston, one of the proprietors of the Glasgow and Ardrossan Canal, took fright, and ran off, dragging the boat with it. It was then observed, to Houston's astonishment, that the foaming stern surge, which used to devastate the banks, had ceased, and the vessel was carried on through comparatively smooth water, with a resistance very greatly diminished. Houston had the tact to perceive the commercial value of this fact to the Canal Company, and he had light thin sheet-iron boats made which were drawn by a pair of horses. The boat started at a low velocity, and at a given signal it was drawn on to the top of the wave, by a sudden jerk of the horses. When once thus placed on the wave crest, it was pulled along with comparative ease, at a speed of 7, 8 or 9 miles an hour.

Coming to later times, the experiments conducted by Captain Rasmussen with the Danish torpedo boat *Makrelen*, and also with one of larger dimensions, called the attention of shipbuilders and engineers to the great effect which depth of water plays in the performances of high-speed craft. At some particular speeds the expenditure of power was very great for slight increases in velocity, whereas when the violent hump was passed, a knot or two additional could be obtained with small additional expenditure of power.

In our own country two classic illustrations have been afforded of the peculiar results which may be obtained. Some years ago, Yarrow & Co., whilst at Poplar, built some river-class destroyers of about 600-tons displacement and 25½ knots speed. Calculation, based on previous trials of destroyers, led to the belief that there would be no difficulty in obtaining that speed with 7,000 horse-power. When the trials commenced, however, there seemed little prospect of the speed being realised with the horse-power contemplated. Progressive trials were made over the Maplin mile, and when the speed approached that guaranteed, a very small advance of speed was obtained with a considerable increase of power. Other contractors experienced similar difficulties, except those who ran their trials on the Skelmorlie mile, where there is a depth of about 40 fathoms.

As the result of experiments made in the Bremerhaven tank, it was found that the depth of water available on the Maplin mile was insufficient, and that the resistance being met with was greatly in excess of that which would be engendered in deep water.

The other illustration is that afforded by the vessels of the Tribal class. These were ships of about 33 knots speed, and when their trials were run it was found that much higher speeds were obtained by the vessels which were run over the shallow courses than by those run on deeper miles. Until experiments were conducted on one particular vessel on both shallow and deep-water courses, it was not quite evident that the vagaries in the results obtained were due to this cause, but it was clearly demonstrated that in this case the shallower the course was, the higher became the speed which could be obtained with a given power.

As the result of experiences similar to the above, it has been found necessary, both in this country and in America, to stipulate that trials should be conducted over courses of certain specified depth. Only by this means can the results of various ships be properly compared.

In connection with this problem, experimental tanks have been of much value in determining the depths beyond which uniformity of result may be looked for. Over certain lengths of these tanks false bottoms have been built, capable of adjustment to varying depths, and the models of different types of ships have been run at varying speeds and their resistances recorded. From the results obtained in these experiments, the percentage increase in resistance which may be looked for with certain depths and with certain types has been found, and the depth necessary to avoid interference determined.

PUBLICATIONS RECEIVED.

[A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.]

Report of the Fuel Research Board on their Scheme of Research and the Establishment of a Fuel Research Station. London: Published for the Department of Scientific and Industrial Research by His Majesty's Stationery Office. 9⅝ in. × 6 in. 20 pages. Price, 2d.

This very valuable report has been issued by the Fuel Research Board with the dual purpose of calling attention to the scheme of research to be undertaken by the Board and of indicating the equipment of a fuel research station necessary for the carrying out of that scheme. With regard to the latter, it has already been announced in the Press. Dr. Carpenter, acting on behalf of the Board of the South Metropolitan Gas Company, has offered to the Fuel Research Board a site near the company's gas works at East Greenwich, which satisfies in every way the requirements of the Board, together with every facility for the transport of coal and other supplies to the station.

The scheme of research to be undertaken by the Board has as its fundamental object the production of a satisfactory smokeless fuel prepared from the carbonisation of coal, which shall replace the 35 to 40 million tons of raw coal at present used every year for domestic purposes, the products of carbonisation being utilised for commercial purposes, and particularly supplies of oil fuel for the Navy being obtained by this means. The report affirms that the Admiralty attach great importance to the development of supplies of oil fuel from home sources, so that this requirement alone would absorb all the oil that could be produced from ten million tons of coal per annum, it being estimated that one million tons of oil fuel can be produced by the carbonisation of twenty million tons of coal, the coke produced being fifteen million tons. The report also deals with the various methods whereby this coke could be utilised. In view of the urgency of increasing the home supplies of oil fuel and other products obtained from the distillation of coal, the research is worthy of the highest encouragement, and should be carefully studied by all interested in this most important subject. The Fuel Board consists of Sir George Beilby, who acts as director; Sir Chas. A. Parsons, Sir Richard Redmayne, and Sir Richard Threlfall, whilst Professor W. A. Bone acts as consultant to the Board.

THE TRAINING OF ENGINEERS.

A large and representative meeting of engineers and educationists was held at the Institution of Civil Engineers on Thursday last for the purpose of considering the establishment of a central organisation for improvement in, and better co-ordination of, engineering training. Sir Maurice FitzMaurice, President of the Institution of Civil Engineers, was in the chair.

A memorandum was circulated at the meeting outlining the origin and nature of the proposal, the memorandum having been prepared by Mr. A. E. Berriman, the Chief Engineer of the Daimler Company, who, together with Mr. A. P. M. Fleming, of the British Westinghouse Company, has taken an active part in the preliminaries. There are three objects in particular, states the memorandum, upon which the proposed central organisation might usefully concentrate its attention.

(1) The co-ordination of engineering training, including the fostering of apprenticeship as a national institution, and the consideration of means by which the works period of an engineering pupilage may be increased in efficiency, and a wider appreciation secured for the value in industry of education of University rank.

(2) The maintenance of a central bureau, where parents and educationists can obtain accurate and comprehensive information relating to the engineering industry, and the proper course to pursue on behalf of boys who are desirous of making engineering their profession.

(3) The promotion of scholarships, or other equivalent means by which the best talent may be enabled to rise to its proper level under the stimulus of educational opportunity.

A resolution that a committee, with power to add to their number, should be appointed to initiate means for giving effect to the object in view, was unanimously carried. The first members of the committee will be representative of Institutions of Civil, Electrical, Mechanical, Gas, Mining, and Municipal and County Engineers, Iron and Steel Institute, Institute of Metals, Institute of Naval Architects, Institution of Mining and Metallurgy, Junior Institution of Engineers, Liverpool Engineering Society, South Wales Institute of Engineers, North-East Coast Institution of Engineers and Shipbuilders, Institution of Engineers and Shipbuilders in Scotland, Institution of Civil Engineers of Ireland, Technical Committee of the Motor Industry, Joint Committee of the Aeronautical Society and Society of British Aircraft Constructors, Federation of British Industries, British Engineers' Association, British Electrical and Allied Manufacturers' Association, Association of Technical Institutes, Board of Education, Headmasters' Conference, Incorporated Association of Headmasters, and Universities and Technical Colleges of University rank.

Sir Maurice FitzMaurice, in opening the proceedings, said the question of improvement in and better co-ordination of engineering training made a general appeal, and if a committee of the character suggested were appointed, a great step forward would have been made. There was a great gap, not fully filled at the present time, between the period when it was arranged a boy was going to be an engineer and when he became an engineer. Many engineers were lost on that account, and many of those who did enter the industry would have been better engineers if they had had some guiding hand at the right time. There were several elementary propositions which should receive consideration in this connection. In the first place manufacturing interests in this country depended mainly on engineers, so that a full supply of young engineers was necessary to recruit the ranks. It was essential that the new comers should be able to receive the necessary training to do justice to the profession, and it was agreed that the facilities for obtaining that education were not altogether satisfactory at the present day. The Council of the Institution of Civil Engineers felt that nothing but good could result from a meeting of that kind, in which all interests, educational, professional, and manufacturing, were represented.

Amongst other speakers Mr. H. B. Rowell, the President of the North-East Coast Institution of Engineers and Shipbuilders, supported the proposal, as also did Mr. W. H. Hichens, the Chairman of Cammell Laird & Co., and a letter was read from Mr. Fisher, the President of the Board of Education, who had hoped to be present and to speak in support of the resolution, stating that the Board of Education will be only too glad to co-operate in any well-considered scheme that the engineering industry may decide to adopt.

The resolution was moved by Sir John Wolfe-Barry, who said that the tone of the discussion indicated that it met with the approval of that representative gathering. His connection with engineering education had extended over forty years, and went back to the time when facilities were extremely limited. Good work had been done by the City and Guilds of London, who had spent upwards of £1,000,000, and were still spending £25,000 a year on technical education. It seemed to him that what he might term the education of the officers training corps of engineering was fairly well provided for, and that what was now necessary was to provide the necessary training on the technical side for the rank and file. He believed we could produce an industrial army second to none in the world, and for reasons which were fairly obvious, the work would have to be done. One of the great problems in arranging for the education of the great body manning the workshops was to get over the antagonism between conflicting interests.

The resolution was seconded by Dr. W. H. Hadow, Principal of Armstrong College, Newcastle-on-Tyne, and carried unanimously.

BRASS AND OTHER COPPER ALLOYS USED IN MARINE ENGINEERING.*

Since reading the paper on the above subject, the attention of the author has been drawn by one of its authors to a paper upon the Inspection of Brass and Bronze, presented in June last to a meeting in America of the American Society for Testing Materials by Messrs. Alfred D. Flinn and Ernst Jonson. Also to two papers by Mr. Flinn upon Experiences with Brass in Civil Engineering Works. One of these latter was read at a meeting of the Municipal Engineers of the City of New York in November, 1914, the other at a meeting of the American Institute of Metals in October, 1915. It is considered that the papers are the most remarkable and most valuable of any which have been published on the subject of "Brass," and well worthy of being brought before this Institute. Both of the latter papers contain descriptions of the brasswork used in the construction of the new waterworks of New York City, commonly referred to as the Catskill Aqueduct, and they record some of the experiences with the Brass from 1908 onwards.

Mr. Flinn states that in America, as is the case here also, considerable confusion exists as to the use of the terms "brass" and "bronze" to describe alloys of copper, and it is worthy of note that in the title of his paper he uses the word *brass*, and in general refers to the metals of which he recounts the experience as "brass," whereas the great bulk of the metal used was manganese bronze, and was termed "bronze" in the specifications. In arranging for the enormous works in connection with the water supply of New York City it was necessary to use immense weights of some strong incorrodible material, and very great consideration was given not only to the designs of details, but also to the composition of the metal used. There were castings to be employed ranging from a weight of a few ounces each to 22,000 lb. (say, 10 tons). Altogether there were about 2,000,000 lb. of copper alloy castings and about 1,000,000 lb. of bolts and other parts. Some of the pieces were forgings, ranging from small bolts up to valve rods 6 in. diam., 31 ft. long, weighing 3,200 lb. The castings included valve chests for valves 72 in. diam., some of them weighing 44,000 lb. each when completed with covers, &c. The total expenditure for the purchase of brass was approximately £200,000. Before ordering this vast amount of metal for one undertaking, several alloys, such as manganese bronze, naval brass, phosphor bronze, &c., were all investigated. Information was sought from responsible metallurgists and experienced engineers regarding designs and specifications, and, as a result, "manganese bronze" was selected for general use, but not to the exclusion of all other alloys. All the articles were obtained under specification and were carefully inspected. Most of the work was carried out by very experienced manufacturers by their own methods, some of the firms having had experience for a very large number of years. Whenever possible hydrostatic and other tests were made, in addition to the customary tensile and bend tests. The specifications stipulated the desired physical qualities, but not methods of production, nor metallurgical composition.

The following extracts from the specifications are taken from Mr. Flinn's papers :—

Bronze Castings.—All bronze castings shall be made of new metal, shall be free from objectionable imperfections, and shall conform accurately to patterns. When the castings are being machined, if the metal shows signs of imperfect mixing, they shall be rejected. Unless otherwise called for in the specifications, or on the drawings, bronze where indicated upon the drawings shall mean manganese bronze.

Manganese Bronze.—All manganese bronze shall be equal to Spare's, Parsons' or Hyde's manganese bronze, and shall have a tensile strength of not less than 65,000 lb. per square inch, an elastic limit of not less than 45 per cent. of the ultimate tensile strength and an elongation of not less than 25 per cent. in 2 in.

Brass Rivet Rod.—Tensile strength of brass rivet rods shall be not less than 55,000 lb. per square inch. The elastic limit shall be not less than 30,000 lb. per square inch and the elongation not less than 20 per cent.

Stems.—The main gate stem shall be of manganese bronze or other bronze of approved composition, of such dimensions that when placed in tension under a load in pounds, equal to the area of the valve opening in square inches, multiplied by 125, the minimum cross section of the stem shall have a resultant unit stress not exceeding two-thirds the elastic limit of the material used. These stems shall be turned straight and true, and shall have all threads lathe-cut.

Rolled Bronze.—Whenever the term bronze is used in these specifications in a general way or on the drawings without qualification it shall mean manganese or vanadium bronze or monel metal. Whenever the characteristics of any material are not particularly specified such material shall be used as is customary in first-class work of the nature for which the material is employed.

The minimum physical properties of bronze shall, except as otherwise specified, be as follows :—

Castings—	
Ultimate tensile strength...	65,000 lbs. sq. in.
Yield point	32,000 ,, ,, ,,
Elongation	25 per cent.
Rolled material, thickness one inch and below—	
Ultimate strength	72,000 lbs. sq. in.
Yield point	36,000 ,, ,, ,,
Elongation	28 per cent.
Rolled material, thickness above one inch—	
Ultimate strength	70,000 lbs. sq. in.
Yield point	35,000 ,, ,, ,,
Elongation	28 per cent.

TYPICAL RESULTS OF PHYSICAL TESTS OF BRASSES USED ON THE CATSKILL AQUEDUCT.

Yield Point lbs. sq. in.	Ultimate Strength lbs. sq. in.	Ratio of Yield to Net.	Elongation per cent.	Reduction of area per cent.	Fracture.
Forgings—					
36,500	73,150	50	41·5	46·8	Irregular.
37,500	75,750	50	35·5	43·9	,,
38,250	76,900	50	35·5	46·8	,,
52,500	77,100	68	31·0	—	Irregular Silky.
49,300	76,150	54	33·5	—	Silky Cup.
50,000	75,350	67	31·0	—	Irregular Silky.
43,500	70,000	62	34·0	47·0	Irregular.
36,000	67,500	53	40·5	43·5	,,
Castings—					
39,650	66,000	60	40·0	—	Irregular Gran.
43,100	68,850	53	25·0	—	,, ,,
39,950	68,050	59	29·0	—	,, ,,
33,000	66,250	50	25·0	25·4	,,
32,750	67,500	48	33·0	27·7	,,
32,250	67,200	48	36·0	34·1	,,
39,500	69,100	57	39·0	—	Irregular Silky.
47,500	71,000	67	40·5	—	,, Gran.
50,000	70,000	71	34·0	—	Aug. Silky.
33,250	73,000	45	30·0	28·5	Irregular.
33,000	73,500	45	35·0	34·0	,,
34,500	73,250	47	40·0	36·5	,,
43,250	69,950	62	40·5	—	Ang. Silky.
44,000	70,050	63	34·0	—	Irregular Cup.
42,500	69,500	61	37·5	—	Ragged Cup.
46,000	69,850	66	33·0	—	Ang. Cup.
44,000	69,600	63	40·5	—	Ang. Fine Gran.
41,500	72,350	57	36·5	—	Irreg. ½-Cup.
40,000	68,000	59	38·0	—	Forked Silky.
42,000	67,000	63	37·0	—	Ang. Silky.
43,750	69,050	63	37·0	—	Forked Silky.

After being forged into a bar, rolled, or forged bronze shall stand : first, hammering hot to a fine point ; second, bending cold through an angle of 120 deg. to a radius equal to the thickness of the bar.

Bronze Pipes.—The pipe shall be seamless drawn, semi-annealed, iron-pipe-size tubing of the sizes shown on the contract drawings or ordered. It shall be made of the bronze specified in the general sections or of an approved commercial bronze. All pipe furnished under this item shall be free from season cracks, surface cracks, or other defects.

* Abstract of Introductory Contribution by the author for the adjourned discussion on a paper read by Mr. J. T. Milton (Vice-President) to the Institute of Marine Engineers on Tuesday, October 9.

When the pipe is finished, ready for shipment, the engineer will subject about 1 per cent. of the lot, taken at random, to the following tests: first, each test pipe shall stand threading perfectly, with a die with the usual thread for the size of pipe; second, after annealing, the end of each test pipe shall stand being flattened by hammering until the sides are brought parallel with a curve on the inside of the ends not greater than twice the thickness of the metal, without showing cracks or flaws; third, after annealing, each test piece shall have a piece 3 in. long cut from it, which, when split, shall stand opening out flat without showing cracks or flaws.

Mr. Flinn states that in spite of the care exercised, the brass furnished proved to be distinctly unsatisfactory in most of the uses to which it was put. No suspicions of definite troubles developed until late in 1913, when numerous bolts and rods were found to be cracked, and since early in 1915 some of the castings from at least three different foundries have also been found to be cracked. All these castings had, before acceptance, been subjected to hydrostatic pressures of 200 and 300 lb. per square inch for a half-hour or more, yet some months later, after having been erected in position, they leaked under pressure of only a few pounds. In some castings the cracks have extended since they were first observed and, in some, additional cracks have been discovered as time has elapsed. In nearly all of the cases of the cracked castings the defects appeared to be close to, or in, a repair made by "burning."

In the cases of defects in plates, bolts, rods, sides and rungs of ladders, &c., some of the articles had not been taken out of their packing cases. In some cases the cracks were fine and superficial, but in others they were deep. In some cases in bolts from $\frac{1}{2}$ to $2\frac{1}{4}$ in. in diameter the whole cross section was affected, some of the bolts being found to be severed. Two or three years have passed in some cases before the defects developed sufficiently to be detected.

In the 1914 paper Mr. Flinn mentions that only a few small brass pipes had failed. He says, indeed, that there is but small excuse for supplying other than dependable brass pipe nowadays, as correct methods of manufacture are well known in the trade; but in the 1915 paper he states that serious failures had been experienced with pipes also. He states that the defects were found to be so general and so distributed through the output of various manufacturers, and were so common in the different kinds of brass that all wrought brass fell under suspicion. After the first discovery of the cracking, replacements were made with brass produced by methods avoiding cold working in the hope that by this further trouble would be avoided, but unfortunately this did not prove to be the case.

It was well known that cold working produced initial strains in the material, and after the discovery of the defects it was decided to use plain, extruded or hot rolled rods wherever practicable and to anneal all material which had to be drawn or rolled cold, in the hope that further trouble would not occur; but, as stated, this hope was not realised, as plain extruded, hot forged and annealed brass rods, supposedly free from initial strains, have also failed in disturbingly large quantities.

It is noteworthy that at the time of reading the paper in 1915 Mr. Flinn was able to state that *large* forgings, which include chiefly the items for large sluice gates and valves, have shown no sign whatever of failure. He states: No brand or make of brass or bronze has wholly escaped. Manganese bronze, naval brass (including a well-known bronze and its imitation) and Muntz metal from *all* the manufacturers who have furnished any considerable quantity, *all* have failed. He makes some very drastic remarks as to the want of such knowledge of the physical characters and capabilities of this group of alloys as is required to be a safe and dependable guide to their manufacture, inspection and use. As his investigations and experience progressed, he found not only unfortunate foundry and shop ignorance of important details of the manufacture of copper alloys, but also seemingly a lack of definite and complete knowledge of some of the fundamental characteristics of these alloys. He says: Before civil and mechanical engineers can venture to use brass extensively for important works where it would be subjected to other than very low stress, some questions will have to be conclusively answered by manufacturers and experts. The following are the questions he submits:—

Can brass or bronze of high tensile strength be reliably produced which can be used safely for important permanent structures in such parts as bolts and other rolled, drawn, extruded or forged shapes?

What should be the specifications for such brasses or bronzes?

What inspection methods and tests should be used?

By what tests can the tendency to subsequent failure be detected at any time after manufacture?

What working stresses can be safely used for these various alloys?

Will these brasses or bronzes deteriorate by reason of constantly applied or frequently repeated stress—*i.e.* will they fail from fatigue?

Can large hollow manganese bronze castings be made of such forms as water and steam valves?

If manganese bronze is not suitable for such castings, what composition can be used?

Can any repairs of brass castings to be subjected to hydrostatic pressure be safely made by any process of "burning in" or welding now commonly used? If so, what relation has the shape and size of the casting to the methods and means to be employed?

What tests can be applied to prove that such a repair has been successfully made, and that later a crack will not develop because of it?

Mr. Jonson made some experiments to show that cold worked brass was always in a state of initial stress. He subsequently found that very similar methods of test had been adopted by Professors Heyn and Martens in Germany. An account of these latter was given by Professor Heyn in his May lecture to the Institute of Metals in 1914. Mr. Jonson in one set of experiments took 6-in. lengths of round rods, faced their ends into parallelism and accurately measured their length. He then reduced the diameter of 4 in. of the length by successive steps of $\frac{1}{8}$ in., measuring the length of the turned specimen. This became longer at each turning, until a small central core only was left. The experiments showed that initially the outer parts of the piece were in tension and the centre in compression. As the portions in tension were successively turned off, the compression became somewhat relieved, and the piece consequently elongated.

Messrs. Martens and Heyn developed a method for determining the tendency of brass to crack by immersing specimens in a solution of a mercury salt. In much strained samples cracks would then occur in a short time, but in other samples, presumably not so much stressed, the cracks would occasionally not become apparent for a number of days. Mr. Jonson found this method to be useful, but not infallible, as some rods which within a reasonable period of observation developed no cracks by the application of the mercury solution subsequently spontaneously cracked. This method of test was thought to depend upon the corrosion of the surface, and many experiences indicated that corrosion had much to do with the cracking under some circumstances. This was amply proved by some experiments upon samples which were subjected to considerable strain and then submitted to corrosive influences. Some pieces of old corroded brass rods were also tested. They would stand bending only 45 to 80 deg. before fracture, but other pieces of the same rod when cleaned with emery cloth could be bent through 160 deg., or even flat on themselves without breaking. On the other hand, to show that corrosion is not a necessary factor in the cracking of brass, it is only necessary to recall that many specimens were found to be cracked when they were removed from the packing cases before being placed in use.

(*To be continued.*)

FORCED LUBRICATION.*

The following is a compilation of forced-lubrication data for the most part from reports of officers in the American Navy.

Fig. 1 shows an arrangement of pipes for forced lubrication for reciprocating engines of the U.S. battleships and cruisers.

Fig. 2 shows an arrangement of pumps, tanks, filters, &c., for forced lubrication for reciprocating engines of battleships and cruisers.

Oil is supplied under pressure to main bearings, crank-pin bearings, crosshead pins, crosshead guides, eccentrics, and ahead faces of thrust-bearing horseshoes. At each main bearing a radial hole is drilled though the wall of the crank shaft to the axial hole in the shaft. In the path of this hole an annular recess is cut in the bearing brass. In a similar manner radial holes are drilled through the shaft and each eccentric to the axial-shaft hole. The axial hole in the crank shaft is connected to the axial hole in the crank pin by drilling a hole in the crank web. Radial holes are drilled in each crank pin to the axial hole in the pin. The axial hole in the connecting rod is extended through the crank-pin brass to the crank pin. The result of all these holes is to form a closed circuit for the oil from the main bearing supply pipe to the top of the connecting-rod axial hole. Oil-tight caps are fitted at the ends of axial holes in the crank shaft and crank pins. A gauge and thermometer is fitted at each bearing.

Referring to Figs. 1 and 2, in the engine and pump room are located a forced-lubrication service pump, a service and return pump and a return pump; a supply oil tank and a water and oil-settling tank; three strainers for supply oil tank, two strainers for discharge to engines, one suction-well strainer box and one drain pump. The supply oil tanks are cross-connected. Oil is supplied to the bearings by either the service pump or the service and return pump, the oil passing through strainers, either pump being capable of using either strainer and its own discharge line.

At each bearing two valves are fitted, one for each oil-feed line, for the purpose of regulating the flow of oil.

The course of oil through the system is as follows: The service or the service and return pump draws the oil from the main supply tank through the suction-well strainer box and discharges through strainers to engine supply pipes. From the main supply pipe branch pipes conduct the oil to the main bearings through holes in the bearing caps. The quantity of oil supplied is regulated by valves at the bearings. Annular grooves distribute the oil through the main bearings and into the crank-shaft axial hole through the radial holes in the journal. The crank pins are lubricated through the hole in the crank web connecting the axial holes in the shaft and web and the radial hole in the crank pin. The eccentrics are lubricated through the radial holes drilled in the shaft and in each eccentric. The crosshead pins are supplied through pipes leading from the connecting rod through the crosshead pin and out through radial holes.

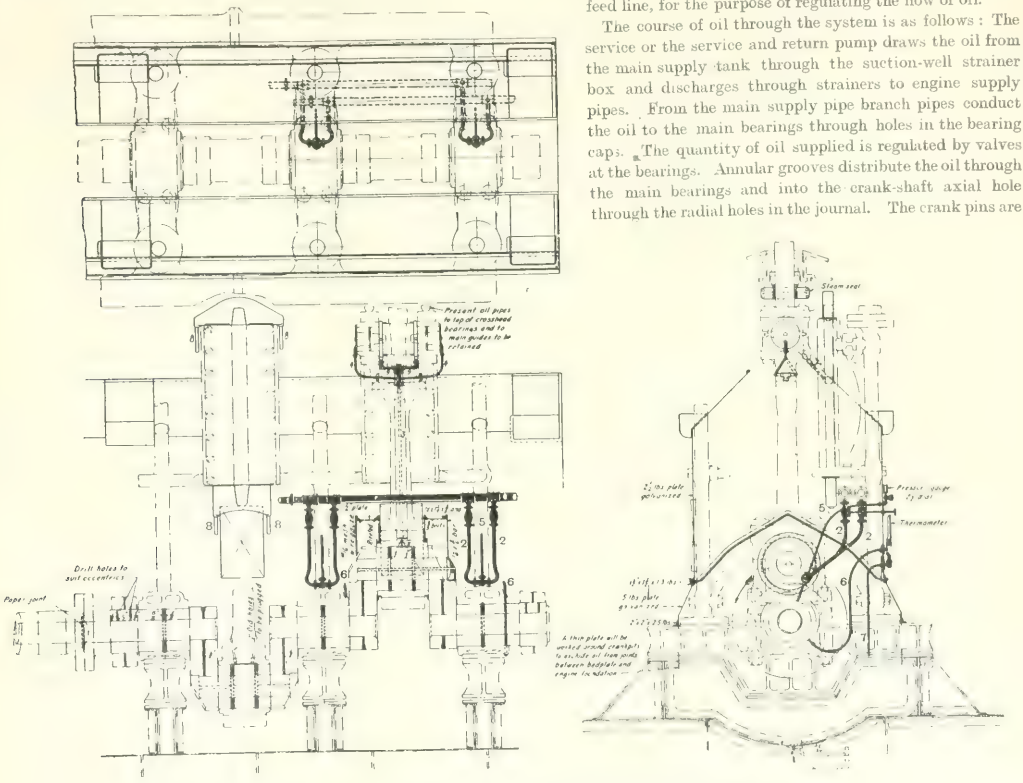

Present oil pipes to top of crosshead bearings and to main guides to be retained
Drill holes to suit eccentrics
Paper joint
Steam seal
Thermometer

Fig. 1.—Arrangement of Pipes for Forced Lubrication for Reciprocating Engines.

The thrust bearings are supplied by pipes from the main supply line. Valves are fitted at each thrust to regulate the supply. After performing its function, the oil is forced out at the ends of the bearings and drains to the crank pit, which serves the purpose of a trough for catching the oil. From the crank-pit oil well, the oil is drawn by the return pump and delivered through strainers to the main supply tank, thus completing the cycle.

The settling tanks provide a means for allowing impurities to settle, after which the cleansed oil can be returned to the system.

* Abstract of paper read before the American Society of Naval Engineers by Lieut.-Commander A. T. Church, U.S. Navy, member, and published in the Journal of the Society.

Fig. 3 is a diagrammatic arrangement of the forced lubrication for the turbines of a battleship. The oil pumps take their suction from the drain tank and discharge through a quadruple-flow cooler and thence to the different bearings, from which the oil drains by gravity to the drain tank. Strainers are fitted in the pump suctions. The discharge of oil from each turbine bearing is through a sight-feed glass, so that the flow of oil can be observed. A thermometer is fitted in each discharge. A valve for independent regulation of the flow is placed at each bearing. There is a complete system for the bearings on the port side of the ship and a system similar in

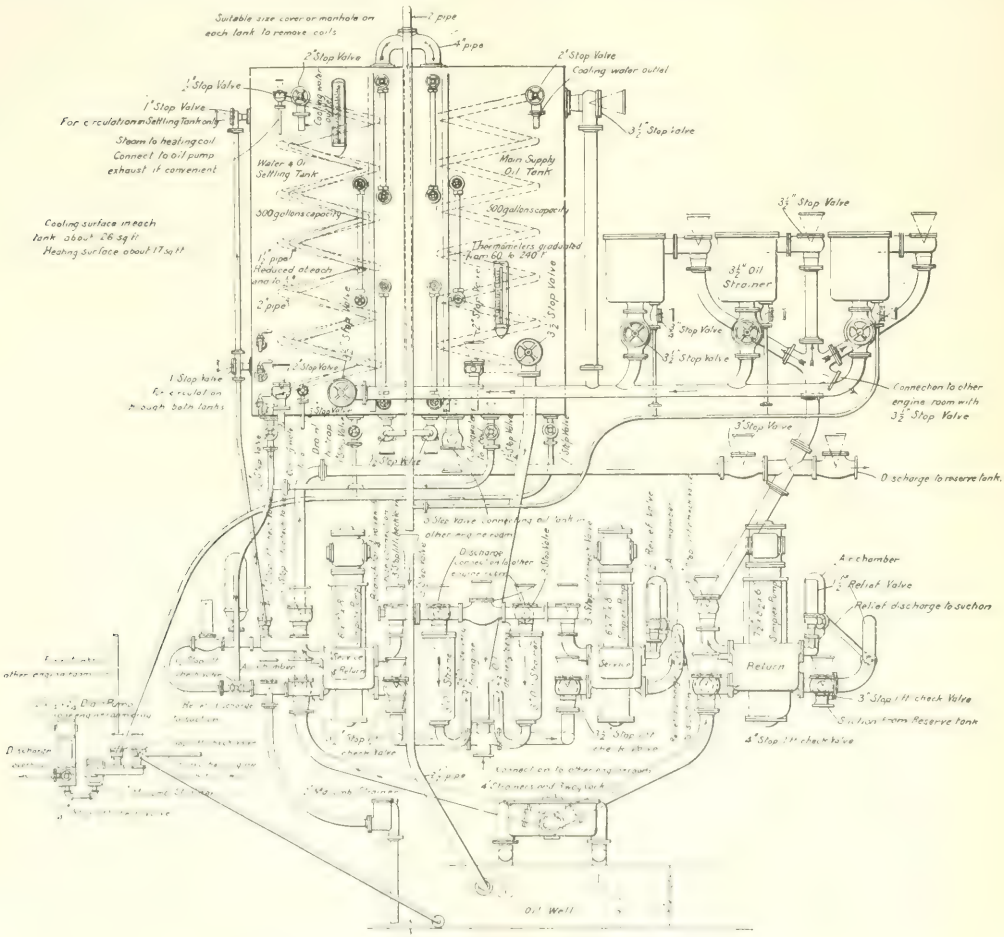

Suitable size cover or manhole on each tank to remove coils
1" pipe
2" pipe
2" Stop Valve
2" Stop Valve
Cooling water outlet
1½" Stop Valve
1" Stop Valve
For circulation in Settling Tank only
3½" Stop Valve
Steam to heating coil
Connect to oil pump exhaust if convenient
Water & Oil Settling Tank
Main Supply Oil Tank
500 gallons capacity
500 gallons capacity
Cooling surface in each tank about 26 sq ft
Heating surface about 17 sq ft
Thermometers graduated from 60 to 240°
3½" Stop Valve
1½" pipe Reduced at each end to 1"
3½" Oil Strainer
2" pipe
3½" Stop Valve
3½" Stop Valve
1" Stop Valve
1" Stop Valve
1" Stop Valve for circulation through both tanks
Connection to other engine room with 3½" Stop Valve
3" Stop Valve
Discharge to reserve tank
3" Stop Valve connecting oil tank in other engine room
Discharge connected together
Air chamber
1½" Relief Valve
Relief discharge to suction
Return
3" Stop lift check Valve
Suction from Reserve tank
4" Stop lift check Valve
4" Stop check Valve
Connection to other engine room
4" Strainers and Tee Valve
Oil Well

Fig. 2.—Arrangement of Pumps, Tanks, Filters, &c., for Forced Lubrication for Reciprocating Engines.

all respects for the starboard side, the two systems being cross-connected, so that in case of emergency the system on either side will provide lubrication to all bearings on both sides.

Where reduction gearing is fitted oil is led from the main supply pipe to a series of nozzles in the gear case. The nozzles are arranged to spray the oil at the point of mesh in both the ahead and astern directions.

On reciprocating-engine ships the pumps are started from 10 mins. to half-an-hour before getting under way. After starting the pumps they may be run for five minutes to insure that all bearings are getting a plentiful supply of oil and to fill the system so that the working pressures will be attained rapidly when pumps are started; then secure them and start again at the first bell for getting under way. The pumps are stopped as soon as word is received from the bridge to secure the main engines, if they have run sufficient time after the last bell for all bearings to receive fresh oil.

On turbine ships, oil pumps should be started from two to three hours before getting under way and run after engines are secured as long as the main circulating pumps are kept running. This is usually from [illegible] although the *Nevada* runs them from six to eight hours.

Pressures used by different vessels are as follows:—

U.S.S. Texas (reciprocating engines).—On the main engines the pressure usually [illegible] 20 lb. per sq. in. Running at full power this pressure is increased to 30 lb. per sq. in.

U.S.S. New [illegible] Pressures carried on discharge side of strainers are from 20 to 30 lb. per sq. in. gauge.

U.S.S. New Hampshire (reciprocating engines).—Between 10 and

20 lb. per sq. in. by the oil-pressure gauges on the various parts of the system.

U.S.S. Delaware (reciprocating engines).—Fifteen to 35 lb. per sq. in. depending upon viscosity of oil and speed of main engines.

U.S.S. Michigan (reciprocating engines).—An oil pressure of 10 to 25 lb. per sq. in. is carried, depending upon the speed of the engines.

U.S.S. Florida (Parsons turbines).—The pressures carried on Parsons four-shaft turbines are 50 lb. per sq. in. at pump and 10 to 12 lb. per sq. in. on farthest bearings.

U.S.S. Arkansas (Parsons turbines).—For cruising speeds the starboard oil-pump discharge pressure is 50 lb. per sq. in. gauge, the port 65 lb. per sq. in. gauge. This gives an average oil pressure at the bearing of about 5 lb. per sq. in. gauge on each engine.

U.S.S. Utah (Parsons turbines).—Pressure at pump before passing through cooler, 25 lb. per sq. in.; pressure in system after leaving cooler, 12 lb. per sq. in.; average pressure on bearings, 9 lb. per sq. in.

U.S.S. Wyoming (Parsons turbines).—Pressure carried at farthest bearings for 10 knots and above, 10 lb. per sq. in., for below 10 knots, 9 lb. per sq. in.

There are two classes of leaks: (*a*) oil, (*b*) water. Either class may be detected by the daily record of the quantity of oil in the drain tanks. If this tends to decrease abnormally it indicates an oil leak in the system, which is easily detected by inspection of bearings and piping. If, on the other hand, the drain tank gains oil it is an indication that there is a leak in the oil coolers permitting the circulating water to flow into the oil. The leak itself is detected by a pressure test of the cooler. No difficulty should be encountered from leaks when reasonable oil pressures are carried.

Oil leaks in coolers may be detected by means of a small pipe tapped into the highest point of the salt-water side of cooler. This pipe serves as a means of getting rid of air, and will show oil if any is leaking from the oil to the water side through the tubes or ferrules of the cooler.

If the oil gauges show a sudden drop in pressure and the supply pump speeds up, inspection should be made to find the cause, which is usually the flooding of some part by opening the feeder valve too wide. If the pressure gradually drops and the supply pump speeds up accordingly, the trouble is usually due to wear of grasshopper joints to crosshead bearings or in main bearings, and should be remedied in port.

If the baffles at the ends of bearings are injured, oil is thrown out as the shaft revolves, and may be thrown out if oil pressure on the bearing is too high.

A ready means of remedying leaks in engine casings is by filling cracks with litharge and glycerine.

When under way a careful watch should be kept on the pumps to see that they do not lose their suction and to keep the pressure constant. A careful watch should be kept on the temperature of the main bearings and thrust bearings, and the system should be frequently examined for the purpose of detecting leaks and to see that the oil is running freely.

Oil strainers should be cleaned every watch.

Effort should be made to keep the temperature of oil leaving the coolers not less than 90 deg. nor more than 110 deg.

A record of average bearing temperatures under various conditions of speed, temperature of circulating water, &c., is of considerable value in determining whether or not temperatures are normal under varying conditions.

Where accessible, the drain pockets under main bearings should be frequently opened, drained and cleaned, as a very heavy sludge is apt to collect there.

Frequent inspection and care of the strainers in the system will aid in keeping the tanks in good condition.

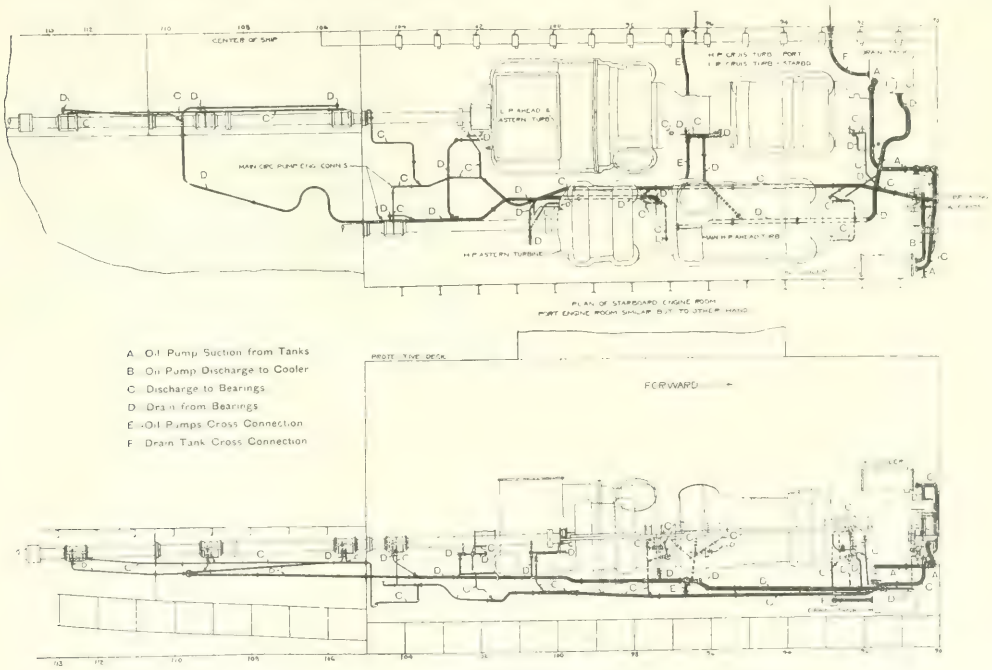

A Oil Pump Suction from Tanks
B Oil Pump Discharge to Cooler
C Discharge to Bearings
D Drain from Bearings
E Oil Pumps Cross Connection
F Drain Tank Cross Connection
FORWARD

Fig. 3.—Arrangement of Pipes for Forced Lubrication for Turbines.

Tanks should be inspected as a matter of monthly routine. When tanks are inspected oil should be pumped to a treating tank, when available, and the oil treated by raising the temperature high enough to precipitate all water and sediment. The tanks themselves should be boiled out and swabbed.

It is not necessary to allow the oil to cool after heating before drawing off the water. The settling out is practically all done while the mixture is hot, and waiting for it to cool has little or no effect.

Conditions in forced-lubrication systems are quite different from those in sight or wick-feed systems. Since the oil is used over and over again, any that may be squeezed out from between the bearing surfaces does not represent a loss; also the oil can be supplied in any amount, thereby eliminating the possibility of an insufficient supply to the bearings. Therefore, a lighter oil may be used than with the wick-feed.

Every effort should be made to exclude water, since the oil must be kept in continuous circulation, and the effect of a water leak soon becomes cumulative. One of the primary requisites of a forced-feed oil is that it must not saponify, and must separate readily from water. Too much care cannot be exercised to keep the oil clean and free from the least grit that excessive wear of bearings may be avoided.

The following tests should be carried out to ascertain the quality of the oil:—

(i) Heat sample up to 400 deg. Fahr.; on cooling, oil should not be much darker than it was before heating.

(ii) Fill a bottle one-quarter full of oil and then add twice as much boiling water as there is oil, shake well, and allow mixture to stand or settle. There should be no deposit, and the line of separation between the oil and water should show practically no paraffin or solid matter. The oil and water should separate wholly, and there should be no emulsification or saponification.

(iii) Fill a test tube with oil and strained gasoline. Shake well and allow to stand for a few minutes. The gasoline, oil, and any water that may be in the original oil will form three distinct layers, and the test gives an indication as to whether or not the oil requires heat treatment for elimination of water.

The Bureau of Steam Engineering requires that forced-lubrication oil for main engines must be a pure mineral oil with sufficient body, must not form an objectionable emulsion when steam is bubbled through it; and, when stirred vigorously for five minutes with cold or boiling distilled water or salt water, must settle out promptly, leaving as a deposit only a small percentage of separated matter.

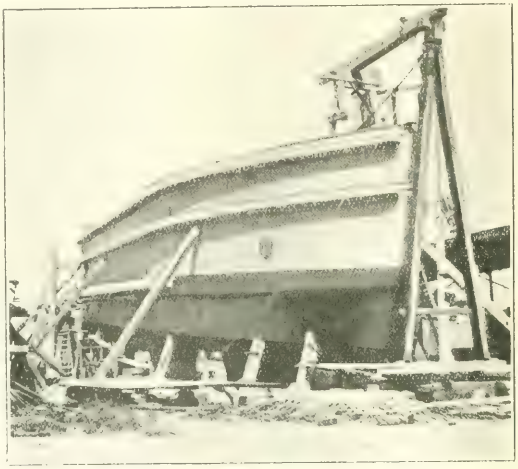
The lubricating value is dependent upon the quality of the oils, and a mixture of different oils gives a result closely approximating the average lubricating value of the oils mixed. In forced-lubrication systems it is permissible to add oil of a different brand to make up losses, and oils may be changed without it being necessary to take all of the old oil out of the system before the new brand can be used.

ANOTHER SHIPYARD EXTENSION ON WEARSIDE.—Supplementary to the news of projected extensions of West Sunderland shipyards, given in these columns in recent weeks, is the fact that a considerable extension scheme at the shipyard of Robert Thompson & Sons, Ltd., Southwick, Sunderland, is now approaching completion. The scheme, which was entered upon before the outbreak of war, has been delayed by reason of shortage of labour and other adverse circumstances, has involved the extension of the yard by about six acres and the concentration of the workshops near the berths and quay in such a manner as to facilitate construction. Hitherto the three berths available would only accommodate ships of under 400 ft. long. The berths have now been extended to take vessels of up to 500 ft. in length, and there is space for a fourth berth on which ships of under 300 ft. can be built. This smaller berth will not be laid down at present, but the site will be ready if occasion arises for its use. The reconstruction will increase the employing capacity of the yard from between 600 and 700 workers to 1,000.

300-TON FERRO-CONCRETE BARGE.

Widespread interest has been recently displayed by naval authorities and the shipbuilding industry in the possibilities of reinforced concrete for the building of ships, barges and other floating structures. This is due to a large extent to the fact that the world shortage of steel caused by the war has of necessity turned the eyes of naval architects to other directions in search of a material which shall displace steel in the construction of ships.

Many reports have reached this country of barges and other small craft which have been rapidly and cheaply built of ferro-



300-ton Ferro-Concrete Barge under Construction.

concrete and which have been found eminently suited for the purposes they were designed to fulfil. But whilst these reports have given full details as to the over-all dimensions of the vessel, its displacement, rate of construction and cost, very little has been divulged as to the actual method of construction adopted, nor have the dimensions of the various parts of the structure been given. We are able this week to supplement the usual description

300-ton Ferro-Concrete Barge after Launching.

of this type of [illegible] which has recently been built on the "Hennebique" system of ferro-concrete construction for the French National Marine, from which the details of the construction of the vessel and the dimensions of the various parts of the structure can be seen.

The chief dimensions are as follows:

Length, overall	94 ft. 3 in. (approx.)
,, between perpendiculars	91 ft. 10 in. ,,
Breadth	19 ft. 6 in. ,,
Depth	11 ft. 4 in. ,,

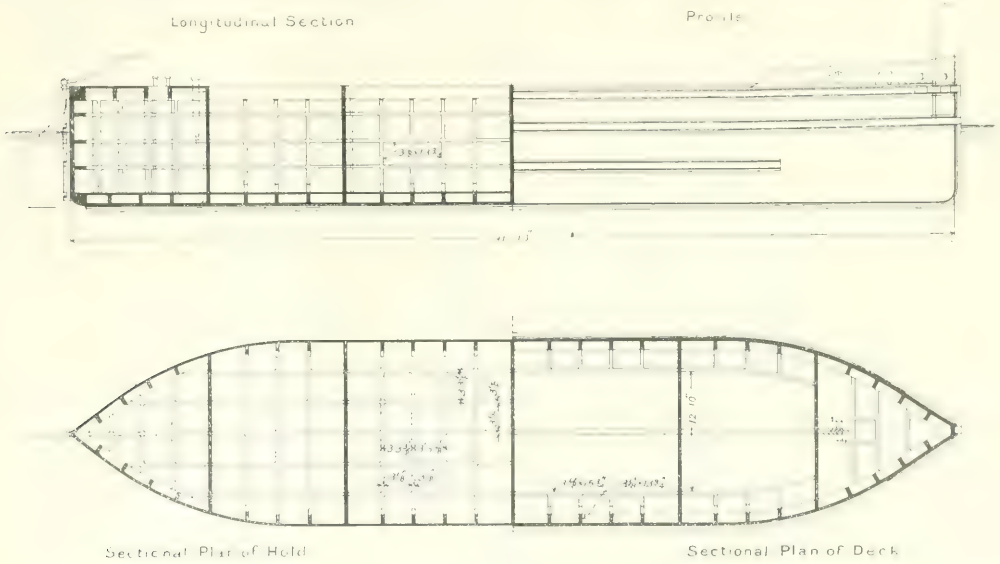
The barge draws 9 ft. 6 in. of water when loaded with 200 tons of coal, and 11 ft. 6 in. when carrying a load of 300 tons.

The general details of construction are given below, the drawing showing the half-profile and half-longitudinal section of the hull together with half-plans of the deck and hold of the vessel. It will be noticed that the vessel has a double bottom and is divided into six separate compartments by means of five watertight bulkheads, access to each part of the hold being obtained by means of iron ladders. The hull is constructed upon what may be considered as a combination of the transverse and longitudinal system of framing, there being a series of transverse frames spaced 3 ft. $3\frac{3}{8}$ in. apart and passing right round the hull save for the opening at the deck which is 12 ft. 10 in. wide in the parallel or midship portion. These transverse ribs which are of concrete reinforced with steel rods to enable them to withstand bending stresses are rectangular in section, $3\frac{1}{8}$ in. wide by $13\frac{3}{4}$ in. deep. The longitudinal frames are also spaced 3 ft. $3\frac{3}{8}$ in. apart and run the whole length of the vessel, the sides as well as the bottom being stiffened in this way. These longitudinal frames, reinforced similarly to the transverse frames are also $3\frac{1}{8}$ in. wide and $13\frac{3}{4}$ in. deep, and thus the skin of the vessel is divided up into a series of squares which are covered with concrete slabs, the whole being cast so as to form a continuous structure. The waining around the openings in the deck is also made $3\frac{1}{8}$ in. wide, but the depth is increased by two inches to $15\frac{3}{4}$ in. The customary accommodation is provided for the crew, and the accessories of the barge include pumps, winch, davit, bollards and hawseholes for ropes or cables.

The arrangement of transverse and longitudinal ribs coupled with a well-designed system of reinforcement enables the outer skin of the hull to be cast of the minimum thickness. This desirable result is also due in no small measure to the monolithic character of the structure throughout. As a consequence of the relatively thin hull of the vessel, the weight of the barge is found to be only a small percentage more than it would have been if steel had been adopted, while the initial cost is considerably lower. Moreover, the avoidance of future annual charges for upkeep will result in a greatly increased ultimate economy.

Two views are given on page 420, the first showing the barge under construction, and the second showing the completed barge after it has been launched, the photograph having been taken when the vessel was resting on its bottom in very shallow water.

We are indebted to Mouchel & Partners, Ltd., 88, Victoria Street, London, S.W. 1, who are contractors in this country for the well-known Hennebique system of reinforced concrete construction, for the illustrations and particulars from which this article has been prepared, and it should be pointed out that the dimensions given above have all been obtained from the dimensions given in French units to which the vessel was constructed.



General Arrangement of 300-ton Ferro-Concrete Barge.

Parcels for Merchant Officer Prisoners. The new official regulations framed by the Central Prisoners of War Committee with regard to merchant captains and officers now interned in Germany, Austria and Turkey, have been occupying the attention of the Imperial Merchant Service Guild, who have been sending parcels to these prisoners ever since the war broke out. The new regulations prescribe for sending six 10 lb. parcels of food during a period of four weeks, whilst relatives may obtain special permission to supplement this by sending direct one 10 lb. parcel per week. The Guild have been anxious as to how responsibility for the sending of these parcels was to be met. It has therefore given them satisfaction to receive a definite assurance from the Central Prisoners of War Committee in which they undertake the responsibility of carrying out the regulations, and they will guarantee that every mercantile marine officer prisoner has the required amount of parcels and bread stuffs sent to him, in so far as it is in their power to ensure this being done, and they will guarantee the cost of doing so. The Central Prisoners of War Committee, however, will look to the public generally and to organisations such as the Guild to do everything in their power to lessen the strain on Red Cross Funds by encouraging subscriptions and contributions in every way possible.

SUMMARY OF TRAFFIC THROUGH THE PANAMA CANAL SINCE ITS OPENING TO COMMERCIAL TRAFFIC.

The following statistics appear in the official *Panama Canal Record*, just to hand :—

Month and Year.	Atlantic to Pacific.				Pacific to Atlantic.				Total.			
	Vessels.	Canal tonnage.		Cargo tons.	Vessels.	Canal tonnage.		Cargo tons.	Vessels.	Canal tonnage.		Cargo tons.
		Gross.	Net.			Gross.	Net.			Gross.	Net.	
1914.												
August	13	58,233	41,931	49,106	11	62,049	44,047	62,178	24	120,282	85,978	111,284
September	27	151,878	109,684	141,762	30	151,568	111,375	180,276	57	303,446	221,059	322,038
October	44	240,925	174,472	168,969	40	220,179	153,744	253,288	84	461,104	328,216	421,257
November	54	247,479	172,825	206,510	38	205,671	149,906	242,291	92	452,570	322,731	448,801
December	43	201,776	145,676	179,235	57	280,896	198,618	271,219	100	485,672	344,294	450,454
Total	181	903,291	644,588	744,682	176	919,763	657,690	1,009,252	357	1,823,054	1,302,278	1,753,934
1915.												
January	41	239,486	169,228	268,082	54	251,085	177,984	240,925	98	490,571	347,212	449,007
February	39	209,822	147,339	150,987	53	245,522	175,523	276,078	92	455,344	324,862	427,065
March	57	289,901	187,568	217,447	80	405,380	288,416	417,610	137	675,281	475,984	635,057
April	59	279,139	199,213	237,384	60	290,738	205,326	285,457	119	569,877	404,539	522,841
May	67	343,701	240,098	246,534	75	380,104	252,252	332,174	142	703,805	492,350	578,708
June	85	412,525	296,694	320,619	60	286,330	201,116	282,561	145	698,855	497,810	603,180
July	93	465,726	297,329	316,773	77	356,145	250,041	388,696	170	821,871	547,370	705,469
August	89	416,463	288,194	249,119	72	353,298	236,857	326,218	161	769,761	525,051	575,337
September	49	235,397	166,751	181,380	51	254,061	178,619	274,937	100	489,461	345,370	456,317
October	—	—	—	—	—	—	—	—	—	—	—	—
November	—	—	—	—	—	—	—	—	—	—	—	—
December	3	1,548	851	671	6	12,446	8,957	12,008	9	13,994	9,808	13,679
Total	583	2,873,708	1,993,265	2,128,996	588	2,815,112	1,975,091	2,837,564	1,171	5,688,820	3,968,356	4,966,560
1916.												
January	—	—	—	—	2	811	559	559	2	814	600	559
February	3	991	694	1,100	1	2,655	1,790	—	5	3,646	2,484	1,100
March	2	387	248	—	1	18,407	11,605	7,000	3	18,794	11,853	7,000
April	32	242,642	162,378	144,133	18	197,193	140,306	224,620	50	439,835	302,684	368,753
May	69	311,881	215,473	218,289	60	257,157	179,070	245,861	129	569,038	394,543	464,150
June	7	346,145	236,358	202,771	54	231,471	163,686	229,020	121	577,616	400,044	431,791
July	59	360,678	247,521	246,004	73	319,339	228,437	352,803	149	680,017	475,958	598,807
August	71	372,042	261,638	246,149	5	295,032	203,310	270,672	142	667,074	464,948	516,821
September	49	316,815	219,308	224,661	51	412,175	294,580	289,317	100	728,990	513,978	602,170
October	74	316,815	221,610	231,016	84	377,457	272,164	416,877	158	695,273	493,774	647,893
November	1	314,179	220,806	198,718	76	303,517	215,398	320,325	118	617,696	436,204	519,043
December	7	362,154	261,181	241,987	73	313,005	222,633	305,696	155	675,159	483,814	547,683
Total	497	2,847,733	2,060,260	2,121,918	626	2,728,255	1,933,609	2,833,750	1,253	5,574,661	3,993,889	4,931,911
1917.												
January	77	382,438	258,317	248,200	98	408,554	303,131	423,262	175	774,867	561,448	671,393
February	64	324,918	226,237	244,507	72	361,947	251,356	332,096	136	686,865	477,603	576,603
March	79	411,468	288,799	315,920	73	368,175	241,339	255,898	152	780,753	530,138	571,819
April	77	398,712	277,108	312,000	77	407,891	274,824	314,905	154	806,603	552,791	627,705
May	67	359,901	181,289	194,092	106	441,175	349,728	433,101	168	801,076	531,017	627,193
June	71	380,074	276,855	315,191	104	380,074	266,809	325,708	175	760,148	543,664	640,899
Total	435	2,257,511	1,508,605	1,630,210	530	2,349,816	1,687,187	2,085,970	965	4,607,327	3,196,792	3,716,180
Grand total to July 1, 1917	1,846	10,742,444	7,118,373	7,626,814	1,920	8,802,693	6,213,782	8,766,536	3,754	17,544,137	12,332,155	15,359,093

GENERAL NEWS SECTION.

PERSONAL.

Sergt. Samuel Carvell, Royal Irish Fusiliers, an employee of Workman, Clark & Co., Ltd., of Belfast, has been awarded the Distinguished Conduct Medal for conspicuous gallantry in action.

Mr. W. G. Flanders, secretary of the Alexandra (Newport and South Wales) Docks and Railway Company, has been presented with a silver tray, with inscription, on the occasion of his retirement from the company's service owing to ill-health.

Mr. Alexander Cleghorn, the new President of the Institution of Engineers and Shipbuilders in Scotland, occupies a prominent position in engineering circles. He is engineering director of the Fairfield Shipbuilding & Engineering Company, Glasgow. Before going to Fairfield, Mr. Cleghorn was engineering manager with Barclay, Curle & Co. At both establishments he has been closely identified with the construction of important vessels. He is recognised as a high authority on engineering matters.

Mr. Alexander Cleghorn,

President of the Institution of Engineers and Shipbuilders in Scotland.

Dr. G. B. Hunter, the chairman of Swan, Hunter & Wigham Richardson, Ltd., shipbuilders, Wallsend and Walker-on-Tyne, has contributed £250 to the Propaganda Fund of the Simplifyd Spelng Sosyeti, London. For many years Dr. Hunter has been an active supporter of spelling reform.

A triple presentation of the Distinguished Service Medal took place on board H.M.S. *Eagle* lying in the Liverpool docks last week. Captain Sims, R.N., made the presentations to Chief Steward Alexander Haddocks, Mrs. A. J. Collins (awarded to her late husband), and Private J. H. Bird, R.M.L.I., for heroic service and devotion to duty.

Sir Thomas Bland Royden, Bart., of Frankby Hall, Cheshire, the well-known Liverpool shipowner, left net personalty £1,270,928, and £1,271,354 gross. He bequeathed Frankby Hall (subject to the use of his widow during her life) and all his other Cheshire lands to the present baronet, and the residue, after providing for his widow and daughters, in equal shares to his two sons.

Mr. Joseph Spencer Compton Watson, of Beckingham, Notts, shipbuilder, who died in August last at the age of 72 years, left estate valued at £10,807 (net personalty £1,694). He left £100 to Edward Payne, for many years in his service as draughtsman; and after other bequests he left the residue of his property to his wife for life, with ultimate remainder to the London Missionary Society.

Mr. W. H. Jones, who was a member of the firm of W. & C. T. Jones, shipowners, Cardiff, has given 1,000 guineas for the purpose of endowing a bed at the King Edward VII.'s Hospital, Cardiff, in the name of his father, the late Councillor Henry Jones; and Mrs. Jones has given a similar sum. Mr. Jones has also presented to the hospital trustees the sum of £650, this being the purchase money of a house bought by them.

Captain A. W. Amey, Master of the ss. *Memling*, belonging to Lamport & Holt, Ltd., has been presented with a piece of silver plate and a sum of money from the French Government in recognition of services rendered by himself and crew to the French patrol vessel *Mésange* in the early part of last year. Several members of the crew are to benefit by receiving monetary awards. Mr. John Geddes, late Chief Officer, who assisted in the rescue, lost his life in January.

Among a number of changes made in the staff of Lloyd's Register of British and foreign shipping the only one which affects the Scottish staff of the Register is the appointment of Mr. James Montgomerie, B.Sc., as Principal Surveyor for the whole of Scotland. Mr. Montgomerie was formerly principal surveyor at Glasgow, he having succeeded Mr. James French in that position in 1916. Born in 1873, Mr. Montgomerie entered the shipyard of William Denny and Brothers, Dumbarton, in 1889, and remained with the firm until 1901. He had a distinguished career as a student, and gained first-class honours in naval architecture. In 1901 he joined the staff of Lloyd's Register in Glasgow, and went to London three years later, becoming senior surveyor there in 1913.

Mr. James Montgomerie, B.Sc.,

Principal Surveyor of Lloyd's Register in Scotland

Sir Owen Philipps, M.P., Chairman of the Union-Castle Company, is credited with an intention to endow chairs of agriculture and botany at Johannesburg University. Speaking at a show in that city a few weeks ago, the Mayor said he had been asked to provide an estimate of the cost involved, which had been forwarded to London, and he hoped that he would be in a position to make a definite announcement on the subject soon.

PORT NOTES.

Konigsberg.—To correspond with the deepening of the sea canal, which is to be effected after the war, the new port is to be deepened from 26½ to 29½ ft. Part of the cost of this work is soon to be voted by the municipality.

Toronto.—Extensive plans for the enlargement of Toronto harbour have met with the approval of the Board of Control, which has recommended to the City Council that authority be given the Harbour Commissioners to raise £500,000 for reclamation work. In addition to continuing improvements on Ashbridge's Bay, the Commission will extend its plans eastwards, and it points out that the land reclaimed will accommodate many factory sites, both during and after the war. It is stated that the sum to be authorised, together with £100,000 on hand, will last the Commission to the end of 1919.

THE P. & O. ACQUIRE HAIN FLEET OF STEAMERS.

It is announced that a provisional agreement has been concluded whereby the Peninsular & Oriental and British Steam Navigation Companies are to acquire the share capital of the Hain Steamship Company, Ltd., at a purchase price of about £4,000,000; this price represents a premium equal to eight times the nominal value of the shares. At the beginning of August, 1914, 39 steamers of a total deadweight capacity of about 256,000 tons were owned by the Hain Steamship Company. At the outbreak of war two of the fleet were in Germany (the ss. *Trevider* and ss. *Treglisson*) and were consequently interned; also, since that time 14 of the company's vessels have been sunk, and three have been sold. The company have recently added the ss. *Trewidden* to their fleet. The following is a list of their vessels, which possess an aggregate deadweight capacity of over 125,000 tons:—

Steamer	Built	Deadweight capacity. Tons
Trevarno	1915	7,800
Tregarthen	1913	7,800
Tregothnan	1903	7,200
[illegible]	1911	7,800
[illegible]	191[illegible]	7,800
Trelawney	1907	6,500
Tremayne	1[illegible]	6,500
Tresillian	1[illegible]	6,[illegible]
[illegible]	1914	7,8[illegible]
[illegible]	191[illegible]	7,800
Trevelyan	1912	7,800
[illegible]	1894	5,000
[illegible]	1896	4,000
[illegible]	191[illegible]	7,800
[illegible]	191[illegible]	7,800
[illegible]	190[illegible]	6,5[illegible]
[illegible]	1914	7,800
[illegible]	1917	[illegible]

In addition to the above vessels, the company control three Danish steamers, each with an average deadweight capacity of 3,000 tons, so that the total carrying power of existing and new vessels is over 150,000 tons.

The profits of the company in the past six years were:—

	£
1912	142,000
[illegible]	[illegible]
1914	150,141
[illegible]	[illegible]
[illegible]	180,[illegible]
[illegible]	[illegible]

We [illegible] [illegible] [illegible]

that some time ago he was instructed to investigate the matter, especially with a view to the avoidance, if possible, of some of the objections which have been raised to several existing schemes, and it was by the courtesy of the Fairfield Shipbuilding and Engineering Company that he was able to present his paper to the Institution. One of the outstanding features of Mr. Riddlesworth's paper is that it is an independent inquiry into a subject which has been prominently before the engineering industry for a few years past. Some of the articles which have already appeared on the subject have been written by those interested in stating the claims of one or other of the various systems in use. In the course of his paper Mr. Riddlesworth, who dealt with the Halsey, Weir, Taylor, Rowan, and Santa Fé systems, gave details of the results of his investigation into the mathematics of the subject. In conclusion, he suggested to the would-be inventor of a new system, "that he should sketch in what he considered to be the desirable premium (or rate) curve, which may not have a change of curvature, and which may not have three only points in a straight line. Then tabulate four values of premium (or rate) and time taken; and turn to the general second degree equation, and solve for the four co-efficients. No doubt unwieldy equations will generally result, but ofttimes approximations and simplifications will suggest themselves, which may make the equation suitable for practical application."

SCOTTISH EAST COAST DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Development of Firth of Forth Ports. In connection with the Forth development scheme a meeting of representatives of seaports on the Forth was held in Leith last week. Reports were submitted by the various representatives showing the facilities, present and potential, which could be made available to the Government in connection with the Naval base at Rosyth. Certain further information is to be obtained, after which the reports will be submitted to the Admiralty. The principal ports interested in the scheme are Leith, Bo'ness, Grangemouth, Methil, Kirkcaldy and Burntisland.

Stonehaven Harbour Rates.—At a meeting of Stonehaven Harbour Board held last week it was decided to increase the harbour rates in order to meet the higher expenditure caused by the war. It was accordingly agreed to ask the Board of Trade to sanction the scale of rates fixed under the Provisional Order of 1891, instead of that of 1882, which is at present in force at the harbour. The Harbour Board also decided to apply any surplus revenue that might accrue towards the cost of the repairs necessary on the jetty and north-west pier. The income of the Board during the past two months shows a slight increase over the corresponding period of last year.

Shipbuilding at Leith.—There is every prospect of considerable extensions being made shortly in the shipbuilding industry at Leith. New ground has already been given off to firms for the extension of existing shipyards, and in connection with one of these schemes the reclamation of a considerable extent of foreshore at the old sea wall will be necessary. This work will, however, require the approval of the Board of Trade, and unfortunately some difficulty has arisen owing to the Crown disputing certain rates claimed by the Dock Commission. In connection with another scheme application has been made by a proposed new company for ground to be used for shipbuilding purposes. It is understood that the Commissioners are giving favourable consideration to the application.

Arbroath Harbour Finances.—The question of placing the finances of Arbroath harbour on a satisfactory basis is still engaging the attention of the local authorities and business men. It is a matter of considerable difficulty on the one hand to secure sufficient revenue to meet the current expenses of the harbour, and on the other hand to meet the claims of the Harbour Trust's creditors. The falling off in the revenue is largely due to the condition into which the trade of the port has fallen because of the war, and also to the difficulty of securing tonnage to bring imports direct to Arbroath. Flax is the principal import, and when manufacturers and importers were in a position to bring it in f.o.b. they had the privilege of supplying tonnage for its transport, and they naturally chartered vessels to come to Arbroath. Changes have taken place, however, and importers now buy their flax mostly c.i.f., which gives the seller the right to send the goods by any way he may choose. Another consideration is that nowadays steamers are larger and not so easily accommodated at a comparatively small port like Arbroath. It is doubtful, therefore, if it will ever have the shipping trade it formerly enjoyed.

NORTH-EAST COAST DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

"Tyne" Lifeboat.—In a sheltered spot near the approach to the South Pier, at South Shields, is the old lifeboat *Tyne*, which was presented to the Port in 1833 by Mr. T. Forrest, a local shipowner, For 50 years the craft rendered invaluable service in time of storm and stress at the mouth of the harbour, and during its long career it was instrumental in saving over a thousand lives. The boat is in the possession of the local Corporation, but the Tyne Lifeboat Society keeps it in venerated regard, and at the latter's suggestion the Town Council has decided to clean and paint the boat.

Increased Port Charges.—The Tyne Improvement Commission received the necessary sanction from the Board of Trade to increase the rates, tolls, dues, and charges leviable by it on vessels, foods, coal and coke by 50 per cent. above the statutory rates, and the new imposts come into operation to-day, November 1. This is the second increase made in the dues this year to meet working costs in consequence of the diminution in revenue resulting from a decreased volume of trade on the river owing to the war, the previous advance having been 33⅓ per cent., which came into force on July 1. The effect is that shipping is now charged 50 per cent. instead of 33⅓ per cent. above the pre-war scale of dues.

Wireless Scholarships.—Practically every ship that is built requires a wireless operator now, and this is making an unusual demand for this class of labour. It is affording a new opening for boys, and the Marconi Company are doing their best to attract youths to the scholarships they are offering at the Rutherford Technical College Wireless School in Newcastle. These scholarships afford special facilities for the training of youths between the ages of 16 and 18 as wireless telegraphists, and the only expense to the student is a doctor's small fee for a preliminary medical examination and for text books. Under expert tutors at the College it is claimed that it is possible for a boy of ordinary intelligence to become an efficient operator at the end of 20 weeks' study, and when he has passed his final examination an appointment is guaranteed.

Shipbuilding after the War. Mr. F. W. Hirst, the well-known authority on economic subjects, paid a visit to Newcastle, where he was the guest of Mr. W. J. Noble, the Chairman of the Cairn Line of steamships, and gave an address on the "Economics of the War." He pointed out that shipbuilding was likely to be active after the war, but it might be many years before the tonnage of arrivals and sailings at the port of Newcastle would reach anything like the pre-war total. The Tyne might hope to maintain or even increase its trade with Scandinavia and Spain, but looking at the figures for 1912, he saw that more than half the arrivals came from Germany and the Netherlands, and that France and Belgium came next. The trading power of France, Russia, Italy, and Belgium would be reduced after the war, and if there were heavy discriminating tariffs, as seemed likely, against Germany and Austria, the foreign trade to the Tyne must be appreciably less.

Taxation and Shipowners.—Mr. Axel F. Ericsson, Chairman of the Ericsson Shipping Company, in an address at the annual meeting of shareholders in Newcastle, made a vigorous protest [illegible] how much would be the [illegible] make the Government meet the [illegible] as regards war risk insurance and hire. Instead of singling out one class of the community for extra taxation, as the shipowners have been, Mr. Ericsson suggested that the only sound policy was to allow people to make as much money as they could, and tax them when they had made it. Of course, everybody knows that it was the high earnings of the shipowners in the earlier part of the war that led to extra taxation, but now the position is altogether different. With so many ships requisitioned and running on Blue Book rates, the earnings have been greatly reduced, and, therefore, a good case can now be made out for more consideration by the Government towards the shipowners.

Mr. Ericsson stoutly supported the "ton-for-ton" policy when the time comes to settle accounts with Germany. He considered that the Allies should insist on the enemy replacing ship for ship in respect of the vessels sunk by German piracy. Whatever the indemnity might be, the enemy could pay only a limited part of it in cash, and, therefore, if the balance was to be paid in kind, why not in ships? If this were done, Mr. Ericsson estimated that the Allies would have a good twelve months' start of Germany in [illegible]

Joint Trade Agreement. Good progress is being made in the shipbuilding areas for the working of the joint trade agreement recently entered into between the Boilermakers' Society and the Shipwrights' Association, both of whose headquarters are in Newcastle. The document is drawn up so that in future the two societies will act together in such questions as the alteration of working hours, general fluctuation of wages, organisation, including matters concerned with non-members and members in arrears, and yard or shop conditions common to both. The scheme is set forth in a circular issued to the branches, and preliminary to an explanation of the details it is stated that :—"The need for a great consolidation of the forces inside the shipyard, ship-repairing and engineering establishments on trade matters has been recognised for some time. Detailed proposals for such joint working agreement having been carried by a large majority of the members of the two societies, it has become necessary to arrange for the working of this joint agreement in the various ports and districts."

Abolition of Leaving Certificates.—So far any fears that may have been entertained that the abolition of the leaving certificates might lead to considerable migrations of workmen and consequent dislocation of industry have not been realised. A fortnight has elapsed since the larger freedom was accorded to labour, and at the shipyards and engine shops on the North-East Coast, the moving of men has been, it is stated, less than in normal times. A few men have gone to other and more remunerative work, but this has had no effect on production. On the Tyne the output is going on as usual, and on this river and on the Wear and the Tees, the employers have been pleasantly surprised at the few applications which have been received for transference of labour. Naturally, the local Shipyard Labour Transfer Committee are very gratified at the way the men are sticking at their work. The workmen are glad to be clear of the irksome restraint which the leaving certificate imposed, and the restored elasticity of conditions is all in the direction of more harmonious relationship between capital and labour.

Mariners Interned in Germany.—A fund started at South Shields soon after the war commenced, and now known as the Interned Tyne Seamen's Fund, has done, and is doing, a very commendable work in providing food for Tyne mariners now interned in Ruhleben and other camps in Germany. There are 120 names on the list of seafarers belonging to North and South Shields, Jarrow, Wallsend, Newcastle, Gateshead, and Blaydon, and to these men three parcels of provisions are sent every fortnight, two parcels one week and one the next, the cost entailed being £60 a week. Up to the present £4,000 has been spent in this excellent charity, and it is known that if the parcels had not been sent the men would have fared very badly indeed. Hitherto, the necessary money has been raised in North and South Shields, where the majority of the mariners belong, but now assistance is being sought at other parts of the Tyneside, as it is a Tyne fund, out of which all the local interned seamen benefit. The first of these outside public appeals will be made at Gateshead on Saturday, November 3, when there will be a street collection under the title of Red Ensign Day.

MERSEY DISTRICT.

[illegible]

Trade with Norway. [illegible] the Norwegian Chamber of Commerce [illegible] Station Hotel, Liverpool. The idea is to promote trade with Norway after the war, and the movement is being led by Mr. Johan [illegible] in Liverpool.

Advance in Wages. [illegible] tion in respect of the application put forward on behalf of 15,000 workers in the skilled trades employed by the Liverpool Ship [illegible] high cost of living is awaited with the liveliest interest. The claim of [illegible] award is daily expected.

Wages and Conditions of Service. The Mercantile Marine Service Association have nominated Captain J. H. Goodwin to represent the Association on the National Board which has been set up by the Shipping Controller to consider and settle questions of [illegible] Captain Goodwin recently retired from active service, and was formerly master for many years with Alfred Holt & Co. (Holt Line).

Committee of Ways and Means.—The good times which the associated steamship companies comprising the International Mercantile Marine Company have had recently, have, it is understood, caused the directors to appoint a committee to consider ways and means of paying off the dividends which have accrued on the outstanding 6 per cent. preference stock, totalling £12,000,000. The arrears to date have reached 88 per cent., and the total involved is £10,500,000.

Claims for Maintenance.—A shipmaster, unlike other members of the crew, has up to now had no claim for maintenance and repatriation in the event of his ship being torpedoed, and recently one captain after losing his ship by enemy action was actually presented with a bill from the Board of Trade of £40 7s. for his maintenance and passage home. As a result of correspondence between the Board of Trade and the principal shipowners' associations, the shipmasters' organisations here have been officially notified by the Board of Trade that it has been agreed that in future where such expenses are incurred on behalf of a master of a ship, the application for repayment shall be addressed direct to the owners of the ship.

Awards by French Government.—The French Consul at this port has, on behalf of his Government, presented to Captain A. W. Amey, master of the steamship *Memling*, belonging to the Lamport & Holt Line, handsome mounted silver plaques and a sum of money in recognition of services rendered to the French patrol steamer *Mésange*. A souvenir of the occasion was also presented to the owners of the ship, while it is understood several members of the crew are also to benefit by receiving monetary awards. The *Memling* fell in with the French patrol vessel which was flying signals of distress, and taking her in tow saved her from being driven on the rocks near Gibraltar. Unfortunately, Mr. John Geddes, the *Memling's* chief officer, lost his life in the gallant rescue.

SOUTH WALES DISTRICT.

[From Our Own Correspondent.]

Employment of Foreigners on Dock Work.—The question of foreigners having access to our docks is being actively discussed in South Wales shipping circles. The matter was brought forward at a recent meeting of coaltrimmers, when the menace to our shipping movements was clearly pointed out. The Cardiff branch of the Dock, Wharf, Riverside, and General Workers' Union unanimously passed the following resolution :—"That we, the members of the Dockers' Union, view with alarm the large number of foreigners who are working in and around the docks at Cardiff, and call upon the military authorities to immediately take steps to remove them from the docks, as, in our opinion, their presence constitutes a serious menace."

Coal for British Possessions and Coaling Stations.—At a meeting of the Cardiff Chamber of Commerce, Mr. T. J. Callaghan explained that a question had been raised regarding the interpretation of the instructions of the Coal Controller with regard to the coal supplied to British Possessions and coaling stations. He (Mr. Callaghan) maintained that, according to the directions, it was quite clear that whatever conditions applied to France and Italy applied to the British coaling stations. The matter had been referred to the Controller so that he might place his interpretation on his own directions. Mr. Callaghan thought the Controller was wrong in his interpretation, but he had laid it down to a deputation that the 2s. 6d. per ton did apply to British Possessions and coaling stations. The Controller was very firm on this point.

To Perpetuate Memory of Cardiff Shipowners.—Many substantial sums of money have of late been contributed by Cardiff [illegible] Another case falls to be recorded. It is stated that the property known as the Penarth Hotel has been purchased by Mrs. J. A. Gibbs, of Penarth, and it is her intention, after the necessary alterations have been made, to present the property, together with the freehold, to the trustees of the National Children's Home and Orphanage. The gift is intended as a memorial to her late husband, Major J. A. Gibbs, D.S.O., who fell in action in September last. It is intended that the premises shall be used for the education and training of boys for the sea and engineering trades. It is expected that when fully staffed and furnished, accommodation will be found for about 150 boys. The home will be known as the "J. A. Gibbs Home," Penarth

Branch of the National Children's Home. It is probable that the purchase and equipment of the hotel will cost about £10,000.

Cardiff Coaltrimmers' Bonus Demand.—It is officially stated that at a meeting of the Central Trimming Board, held at Cardiff on Friday, the demand of the South Wales Coaltrimmers for an increase of 37½ per cent. on the war bonus was thoroughly considered, and after the men's case had been submitted, the employers, after a private consultation, decided to offer the men 22½ per cent., making the total war bonus up to 60 per cent., provided that the Cardiff men would agree to withdraw a circular, dated October 24, demanding payment for being ordered out to vessels not in dock, or if in dock, not available for loading cargo or bunkers. The offer was then considered by the men's representatives and accepted on getting a promise from the Board that the waiting time should be considered by each local board. It was decided that the trimmers were entitled to the bonus on the gross tariff charges. The increased bonus will come into force on and from to-day (November 1), and will apply to all jobs not completed loading or bunkering by 6 a.m. on that date. The ballot on the pooling-of-labour question closes to-morrow (November 2).

Neutral Shipowners and British Shipyards.—Mr. W. H. Seager presided over a meeting of the Cardiff and Bristol Channel Shipowners' Association, when the following resolution was carried:—"That this meeting, in view of the knowledge that foreign shipowners are obtaining or attempting to obtain contracts for building ships in British yards as soon as Government requirements have ceased, are of the opinion that such arrangements are contrary to the national interests, and that this Association urges upon His Majesty's Government to prohibit foreign shipowners from placing such contracts in British yards, and also contracts for machinery and appurtenances, until a fixed period of at least five years after the war." Copies of the resolution have been sent to the Controller of Shipping, the Board of Trade, and the Chamber of Shipping.

With regard to the report of the Chamber of Shipping and the Liverpool Steamship Owners' Association on shipping policy after the war, it was decided to call a special meeting to consider the recommendations made.

Mr. Daniel Radcliffe stated that the question of Blue Book rates was being considered by the Chamber of Shipping, and the meeting of that body would take place in November.

The recommendations of the South Wales Commissioners into industrial unrest were considered, and it was decided to bring the matter up at the next meeting of the Association.

Other subjects dealt with were those relating to seamen's wages, the Shipping Requisition Bill, and the Local Marine Board and its constitution. The chairman commended to the generosity of the members King George's fund in aid of Marine Benevolent Institutions. The chairman announced that the sum of 1,000 guineas had been contributed by Sir William James Tatem, Bart.

BELFAST DISTRICT.

(From Our Own Correspondent.)

Demand for Increased Wages.—Wintry weather has been experienced in the local yards during the past few days. There is no falling off in the amount of work in hand, which is being got through expeditiously. The demand for increased wages, affecting 25,000 hands, came before the Committee on Production (Sir David Harrel, Colonel Denny, and Mr. G. Rowe) on Friday, when Mr. Saxon J. Payne represented Harland & Wolff, and Mr. Wm. Strachan was present on behalf of Workman, Clark & Co. The society's representatives present were Mr. [illegible] Ireland, Irish Organiser of the A.S.E., Mr. A. Lorimer, A.S.E., and Mr. C. Greig, of the National Amalgamated Union of Labour, Mr. Harry Howard, of the Boilermakers, and Mr. H. Attwood, of the Ironfounders' Society.

Rates and Dues.—The new schedule of rates on goods, vessels, and tramway tolls proposed by the Belfast Harbour Board will come up for final ratification on Tuesday next, November 6, when it was not anticipated that there will be any opposition. The trading community has accepted these extra imposts with the best grace possible, recognising that in an age when everything is advancing in price the rates must go up. In the case of goods the increase is one of two-thirds of the original rate, inclusive of the 20 per cent. already in force, so that it will work out at a net increase of 30 per cent. In the case of vessels the advance is one of one halfpenny per ton on cross-channel ships and of twopence per ton on ships for foreign ports. The Commissioners did not make any increase on rates on goods and vessels until May, 1917, when an advance of 20 per cent. was made, and the proposed increases now, which do not become operative till January 1, 1918, are the second raising. The new cranage rates come into force on November 1; they are 5 per cent. up, and 15 per cent. higher than pre-war rates.

THE FREIGHT MARKETS.

(From Our Own Correspondents.)

London.—Chartering on the Baltic Exchange moves slowly, although rates are still maintained at the high level which has been current for some time. The demand from the ports of the North-American Atlantic seaboard, and the last is still pressing, and tempting freights are available to owners with tonnage at their disposal. There is no change in the River Plate section of the market, and homeward, 145s. still offers from the up-river ports, or 5s. less for down-river loading. From the Northern Range net form of charter is worth 240s. to the United Kingdom, 260s. to France, and 360s. to West Italy. For Gulf loading, an additional 30s. would be conceded on these figures. The rate rules steady for heavy grain at 30s. to the United Kingdom, or 32s. 6d. to France, while, for oats to the United Kingdom, 25s. offers. Virginian coal charterers are seeking tonnage for which they are prepared to pay 125s. to the River Plate; $30 to Rio de Janeiro; and $32 to Santos. For sugar, Cuba to France, 280s. is forthcoming. The strong demand from the East continues unabated. Karachi indicates 250s. to this country on scale basis, and Bombay the same figure on deadweight. To the Mediterranean, Bombay offers 400s. on deadweight. Calcutta would concede 550s. to Santos on jute basis. Kernels to Marseilles from the Madras coast are worth fully 550s. The rice ports are offering big figures. Burmah to this country could be done at 600s., and Saigon to France is also worth 600s. In the Mediterranean section of the market, chartering is proceeding steadily from the ore and phosphate ports. Huelva to the Mersey commands 45s., or for pyrites to the east coast, United Kingdom, 60s. Bilbao to Boulogne could be done at 50 frs. Bougie to the Clyde commands 50s., and Tunis to the Clyde, 65s.; while Sfax to the Bristol Channel is quoted at 70s. In the Bay trade, rates are indicated by fixtures from Bordeaux to the Bristol Channel at 22s. 6d.

Glasgow.—Freight conditions on the Glasgow market have not varied much since our last report. Tonnage continues as small as ever and the difficulty of arranging business is no less acute. Both in the outward and homeward trades firm rates were quoted, but in a good many cases these were only nominal owing to the lack of actual business. A time charter for a steamer was reported arranged as follows:—States and West Coast trade, 42s. 6d. on round trip, delivery New York, re-delivery north of Hatteras. Another steamer was reported fixed for general trades on time charter at 45s., six months. Virginia to the River Plate, fixed at 76s. net, coal, November.

Newcastle-upon-Tyne.—The local coal trade is still being sorely hampered by reason of the insufficiency of the supply of collier tonnage. There is a very large inquiry for vessels for most destinations with which we nowadays do business, and rates in nearly all directions are very firmly maintained. An exception to this rule [illegible] for which considerably lower figures are being taken than was the case a week ago. For example, there have been five fixtures to Gothenburg, aggregating about 10,600 tons of shipping at rates which have varied from 183½ kr. to 187½ kr., as against from 190 kr. to 195 kr. a week ago, whilst Stockholm has been twice done at from 195 kr. to 197 kr., a decrease of about 10 kr. on the week. Much more business in this direction has been done than for all other destinations combined, but very much more business is on offer for Scandinavia generally. Coastwise, several steamers have been fixed [illegible] for London, and there is a good additional advance in rates for the Spanish-Mediterranean, vessels having been engaged for Barcelona discharge at from 250s. to 260s., [illegible] the Lisbon quotation has risen to 95s., whilst Oporto is steady at 105s. Gibraltar could be repeated at 100s. and, probably, there would be little difficulty in securing last week's figure of 160s. for Bilbao. The Port Said market has not been tested recently, and, in all likelihood, very much more than the 165s., which represents the shippers' idea of freight, could be secured by owners.

Liverpool.—Outward freights continue firm with an active demand at [illegible] per [illegible] is [illegible] and steamers

destinations, but also offer very sparingly. The same conditions [illegible] A neutral boat of 5,500 d.w. has been fixed for the Tyne-Hamburg round for six months at 43s. 6d. Business in the homeward trades is very limited, though there is no lack of competition for tonnage. Easterns, though quoting tempting rates, fail to attract ships, and rates from Indies are also higher, Bombay quoting 300s. d.w. to United Kingdom, and 400s. Mediterranean. Higher rates are also offering from Burmah and Saigon to United Kingdom and France. North America continues active, but with few offers net charters are difficult to fix. Rates generally are firm, and for grain have a hardening tendency. Mediterranean ore ports are booking tonnage freely at firm rates, while Bordeaux fixed a 3,000-ton boat to Bristol Channel at 22s. 9d. prompt. River Plate quiet, but 145s. still offered from up-river, and 140s. lower ports.

Cardiff and Swansea.—Chartering has been a little more active than for some time past. In the early part of the period under review tonnage was slightly more plentiful, but later on, owing to the stormy weather, the position was not so good. The bulk of the transactions reported were, as usual, for Allied destinations, and business for the near French trade was active. There was a strong enquiry for Spanish and South American destinations. A neutral steamer was asking 125s. for the River Plate, but no business was reported. The following fixtures for France are announced:—Brest, twice at 45s. (neutral); Caen, 48s (neutral); St. Malo, 21s. (Allied); Trouville, twice at 48s. (neutral); L'Orient, 29s. (Allied); La Rochelle, 61s. 6d. (neutral); St. Nazaire, Newport loading, 61s. 6d. (neutral); Rouen, 74s. 3d., coke (neutral); a small sailing vessel received 100s. for Granville. On the Swansea market there continues a very strong demand for tonnage. Quotations have been easily upheld to the maximum levels for limitation destinations, while a firm tone has prevailed for other directions. Business reported done comprised Guernsey, at 42s.; Havre, 45s. 9d.; Honfleur, 48s.; Granville, 48s.; St. Malo, twice at 43s. 6d.; Trouville, Port Talbot loading, 48s., and Rouen, 50s. 3d., and twice at 48s. 9d. These fixtures were for neutral vessels in each instance.

Hull.—The market has a firm tone, and, though tonnage is everywhere scarce, a fairly active business is being done with the North French destinations at limitation rates. In the West Italian market there is a good demand for tonnage, but only a small business is permissible owing to the difficulty of obtaining suitable tonnage. There is also a keen enquiry from Scandinavian destinations for coal cargoes, but the restrictions leave little business possible.

THE COAL MARKETS.

[illegible]

The recent spell of colder weather has given a stimulus to the coal trade in that it has greatly increased the demand for household fuel, but as the collieries were already fully booked up with orders for coal of this description, it is to be feared that the actual amount which has come on the market is no larger.

[illegible] The difficulties of transport are proving so awkward that the markets of the North-East coast and South Wales are most uncertain in tone. In some cases collieries appear to be well stemmed, and are getting rid of the whole of their output without difficulty. In other instances, and these it is to be feared are the more numerous, short time is the rule, and some pits have had to shut down altogether.

Conditions have altered from day to day, but generally speaking, it may safely be said that the coal exporting trade is in a disturbed and patchy state, and that all concerned would welcome the arrival of more tonnage and improved railway facilities, thus providing for a freer flow of wagons, which would enable stocks to be moved to better advantage.

[illegible] coal trade. It has prevented the arrival of much tonnage that was looked for, and as a consequence, the call for bunkers has not been great. Supplies of all descriptions of bunker fuel are more than ample for the needs of the moment, even at the South Wales ports, where the transport conditions had certainly began to improve.

On the North-East coast there are abundant supplies of bunker coal on offer at schedule prices, which are 24s. to 27s. 6d. for bests; 26s. 6d. for ordinaries, and 30s. for specials, the last-named being somewhat scarce and firmly held. At the South Wales ports, the demand for bunker coal has subsided to insignificant proportions, and large quantities are available at 18s. to 22s. 6d.

The coal trade of the North-East coast has developed on the quiet side, so that the collieries have once again had to resort to short time to avoid accumulating excessively large stocks. Stormy weather, which was responsible for delayed arrivals of steamers, has been largely responsible for the market setback, but in addition, the demand has fallen off, and inquiries are few. For best steams there is still a good outlet, but other classes of fuel are produced in greater quantities than the occasion demands, having regard to the impossibility of moving more than a certain quantity on the railways, and the shortage of tonnage. For small coal, the demand is most disappointing, but the inland requirements continue to absorb a large proportion of nuts and coking coals.

Household fuel is moving off fairly well, and the coke trade, too, is still good. It is reported that a contract for between 18,000 and 19,000 tons of best north country steam coal, shipment December and January, at 5 per cent. over schedule prices, has been placed with Newcastle merchants by the Norwegian State Railways authorities.

Quotations are for best Blyth steam, 30s. to 32s. 6d.; and smalls, 18s. 6d. to 20s. 6d.; Tyne primes, 29s. 6d. to 32s.; and smalls, 18s. 6d. to 23s.; second steams, 25s. 6d. to 30s.; and smalls, 18s. 6d. to 20s. 6d.; unscreened steams, 24s. to 25s.; North Northumberland steams, 28s.; and smalls, 20s.; smithies, 25s. to 30s.; nuts, 30s.; best bunkers, 24s. to 27s. 6d.; ordinaries, 26s. 6d., and specials, 30s.; Durham gas coals, 23s. 6d. to 30s.; coking coals, 17s. to 25s.; foundry coke, 42s. 6d.; and blast furnace coke, 28s.

The South Wales coal markets had been evidencing an improving tendency, until the stormy weather came along, and put an end to the period of improvement. The market is, however, a little more buoyant than it was, though there is irregularity, and loading arrangements have been more or less dislocated. For the best steams there is a steady demand, the takings of the authorities being large, but other classes are neglected, and there is practically no demand whatever for smalls. All classes of bituminous coals are well taken up, and coke is difficult to get.

Approximate prices, subject to the recent increase of 2s. 6d. a ton are, for best steams, 33s; second steams, 30s. 9d. to 31s. 6d.; ordinary steams, 30s.; drys, 28s. 6d. to 30s.; steam smalls, 18s. to 22s. 6d.; best large black veins, 30s.; western valleys, 29s.; eastern valleys, 28s. to 29s.; nuts, 28s. 6d. to 30s.; duff, 14s. to 18s.; No. 3 Rhonddas, large, 30s. 9d., and smalls, 26s.; No. 2 Rhonddas, large, 27s.; and smalls, 17s. to 19s.; through and through, 22s. 6d. to 23s. 6d.; hard coal, 30s. 9d. to 33s.; gas coal, 21s. to 25s.; and patent fuel, 30s.

The Scottish coal markets are without improvement, and there is no alteration to note. The conditions generally are dull. Export business is meagre, but a good quantity of coal continues to be taken up inland. This is not sufficient, however, to make up for the restricted overseas business, and the pits are by no means fully employed.

Prices are, approximately, for splints, 28s. to 30s.; Hartleys, 29s.; ell coal, 26s. 6d. to 28s.; screened navigations, 28s. to 30s.; unscreened navigations, 23s. 6d. to 25s.; steams, 27s. 6d.; and nuts, 21s. to 23s. To these prices must be added 2s. 6d. per ton where the coal is not being shipped to allied countries.

The Hull coal market is still suffering from a shortage of supplies. A great deal of fuel continues to be sent to France from Hull, and, further, the authorities are taking considerable quantities, so that practically all the supplies are earmarked, and even merchants with contracts running, are unable to get all they need. New business is [illegible] The inland demand is very strong.

Prices are, for steams, 30s. to 35s.; Hartleys, 27s. 6d.; gas coals, [illegible] 27s. 6d.; nuts, 23s. to 27s.

In the Midlands, pressure is being exercised on the collieries to increase their outputs, as the requirements of the munition and manufacturing works are maintained at high pressure. The pits, however, are working at their utmost capacity, and there is no margin between supply and demand.

The London market is rather quiet and sparsely attended by operators, who find it hard to get regular supplies of fuel, notwithstanding [illegible] controller for directing a certain proportion of the production of the pits to the Metropolis. Practically the whole of the steam coal coming forward is on contract account. There have been a few dealings in house coal, as a result of the [illegible]

COMPANY MEETINGS.

Ericsson Shipping Company, Ltd.—The annual meeting was held on October 24. [illegible] Tyne. The Chairman (Mr. A. F. Ericsson, J.P.), in moving the adoption of the report, said that the year's trading had turned out fairly satisfactory, but prospects were such that, unless the Government met the shipowners in an equitable manner as regarded war risk insurance and hire, it would be impossible to make ends meet, apart from the necessary depreciation. Reference was made in the directors' report to the new steamer and to the fact that this company was formed to demonstrate and prove the advantages of the "Monitor" corrugated type. Apart from undeniably increased strength, as compared with the ordinary flat-sided vessel, this type gave increased speed or reduced consumption, greater carrying capacity with less material used in construction—advantages which the "Monitor" Company thought would be the very thing for the standard ships building and to be built by the Government. Consequently the managing director of the "Monitor" Company, Mr. Ormston, and their agent, Mr. Humphreys, placed full particulars before the Merchant Shipbuilding Advisory Committee to the Shipping Controller, but without any result. Why this was so was a mystery to them at the present time. With respect to British shipping as a whole, he was in full agreement with the resolution passed at the North of England Steamship Owners' Association last week. At the same time, it was necessary to point out that in preventing British shipowners [illegible] replace their fleet, as opportunity offered, by the building of new vessels, it would be not only the British shipowners who would necessarily suffer, but the very large number of trades that went to make up the finished ship, and particularly the workmen engaged in those trades.

The report and accounts were adopted.

Manchester Liners, Ltd.—The nineteenth annual meeting was held at Manchester on October 22. The chairman (Mr. Robert Burdon Stoker), in moving the adoption of the report, said that the profit available, after making all necessary provisions, was £175,330—somewhat under last year's figures. This balance the directors proposed to treat on the same lines as last year—namely, to carry £100,000 to reserve, to pay a dividend of 10 per cent. [illegible] of 15 per cent. (both free of income-tax), to transfer £5,565 to debenture reserve fund, and to carry £14,118 forward to next year. The war bonus had set aside [illegible] officers, &c., had disappeared. It had been originally intended to add to that fund yearly, and to distribute the same at the end of the war, but the directors had decided to make the allocation forthwith, and in the future, instead of making the intended extra provision in this way, to arrive at the same object by means of direct addition to the monthly pay of officers. They were now completely under Government control. Their experience was now, therefore, devoted to the task of ensuring on the one hand the best possible result for the shareholders from the very inadequate payment now doled out by Government, and on the other hand, that the very best possible return be secured to the Government. This latter they recognised as a patriotic duty to the nation. With the exception of a slightly increased allowance since conceded, the requisition rates (or, as they are called, Blue Book rates) remained much as fixed at the commencement of the war, and were on a very inadequate scale. These rates were originally fixed with some regard to prevailing market [illegible] at that time. During the progress of the war, however, all costs of stores, insurance, and [illegible] under the requisition conditions, had increased enormously, without any increase whatever being granted by the Government, except that alluded to. To-day the requisitioned British cargo shipowner receives a monthly [illegible] deadweight, as against the [illegible] neutral gets, for the same [illegible] Representations in regard [illegible] by the properly accredited shipowners' organisation, and it is hoped they will result in an alteration in the scale now prevalent, so that the British shipowner might be placed in a more satisfactory position to meet that competition which the future had inevitably in store for him. On the subject of food prices as affected by freights, he submitted that, despite the fact that steamship owners now got a mere pittance from the Government in the shape of rate, food prices were soaring [illegible] were practically [illegible] Government now got the trading profit, the general consumer benefited in no particular by a reduction in the price of commodities. Since the last meeting, they had lost certain of their vessels, unfortunately in some instances with loss of life. In earlier cases of loss the Board had deemed it prudent to replace the ships and to maintain the fleet to its full number. To-day's conditions, however, were entirely different. They had decided, therefore, not to replace steamers recently lost, because every British ship, or practically so, of their class was controlled by Government, and in event of sale passed to new owners with that control upon her. The general outlook was such as to make it very doubtful indeed as to whether prices of tonnage, new or secondhand, after the war might remain as at present or recede smartly. They preferred, in the meantime, to conserve their capital and place it in War Loan. As to the prospects for the future, he could only say that it was enveloped in obscurity. The present control at Blue Book rates might continue for some time after peace was declared. The requirements of the world for replenishments, &c., would be enormous, and we should further be faced with the very large shortage of freight space arising from the destruction of tonnage through enemy operations and other causes. The replacement of this tonnage would be a very grave question, as the competition of other countries for the purchase of such new tonnage would be severe. He was seriously afraid that that section of British shipping which relied for its profits on operation in open markets would be faced by strenuous competition from those neutrals who had benefited so greatly financially during the war, [illegible] from some [illegible] ships.

Mr. J. D. Williams seconded the motion, which was carried.

COMPANY REPORTS AND DIVIDENDS.

Canada Steamship Lines.—Dividend 1¾ per cent. on the preference shares, payable November 1, and 3½ per cent. payable January 2 1918.

Reiherstieg Schiffswerfte u. Maschinenfabrik, Hamburg.—The directors have decided to recommend a dividend of 8 per cent. for 1916-17, compared with 6 per cent. last year.

Bremen Vegesack Fischereigesell.—The share capital remains unaltered (£73,400). The gross profit for the past financial year was £15,000 (compared with £4,390 last year); depreciation absorbed £2,690 (£1,240); and a dividend of 10 per cent. (nil last year) was paid from the surplus of £12,400 (£690). The book value of the fleet, including vessels under construction, is £31,600 (£30,900).

Visurgis Heringsfischerei A.G.—The report for 1916-17 announces profitable employment of the company's fleet, to increase which it is proposed to raise the capital by £31,900 the total capital would then be £88,000. The accounts for the past year show receipts, £29,250 (£20,720 last year); depreciation, £13,500 (£4,250); net profit, £3,950 (£6,900 for 1915-16); dividend, 4 per cent. (£6,320 net loss). The company is engaging in fresh-water fishing as well, from which it expects to derive good profits.

Italian Shipping Companies.—The *Lloyd Italiano*, Genoa, closed the working year 1916 with a net profit of £158,000, *i.e.*, £32,000 less than in the previous year. The company's vessels made 13 journeys to North America and 9 to South America. A dividend of 8 per cent. was paid. The book value of the fleet is £470,000. The *Italia Co.*, Genoa, paid 8 per cent. dividend from £150,000 profit; and *La Veloce* paid 8 per cent. from £94,000 profit. The latter company lost the ss. *Siena* and *Stampalia* by enemy sinkings, but the fleet consists still of four vessels, having a book value of £[illegible] The [illegible] cargo vessels, and paid 8 per cent. dividend for 1916. The book value of the fleet was increased by purchases from £352,500 to £[illegible] The [illegible] *Rosso*, ordered in this country, was requisitioned by the Government. By the transfer of £198,000, the share capital was raised to £980,000, and has been further increased to £1,585,000 by the [illegible] been increased from £39,600 to £298,000. The *Transatlantica Italiana*, share capital £1,190,000 (one-third paid up), distributed 8 per cent. dividend from a net profit of £280,000 for 1916. The book value of the fleet is £505,000. The *Navigazione Alta Italia* (Turin), with a capital of £396,000 (half paid-up), and seven steamships, totalling 31,281 gross tons register, with a book value of £181,000, realised £323,000 profit, and paid 23·65 per cent. dividend. The *Societa* [illegible] cent. dividend from a surplus of £3,510.

NEWS PARAGRAPHS.

Wages of Seamen.—The executive committee of the Shipping Federation last week discussed proposals from vessels' owners throughout the country in connection with the wages of seamen. The proceedings were private, and no official statement was issued.

Awards for Repelling Submarines.—Surveyors of taxes have been instructed that the awards made to captains and officers in the merchant service for beating off or escaping from enemy submarines should not be included in the computation of the income-tax liability of the officers in question.

Increased Pay for Ship Stewards.—An agreement has been signed on behalf of the Director of Transports and Shipping and the National Union of Ship Stewards, Cooks, Butchers and Bakers, that the stewards shall receive the same increases as were recently granted to others, the boys to receive one-half.

Cayzer, Irvine & Co., Ltd.—This firm notify that their head offices at Glasgow, and those of the Clan Line Steamers, Ltd., are being transferred to London. From October 29 their address will be 2, St. Mary Axe, E.C. 3. The address of the Glasgow office will continue as hitherto.

Admiralty and Clyde Workers.—Dr. Macnamara has stated in the House of Commons that a letter was sent expressing the high appreciation of the Admiralty of the workers on the Clyde who were responsible for the building of the naval gunboats used in the advance on Bagdad. He says that the gunboats materially assisted in the operations resulting in the capture of Bagdad.

State War Risks Insurance of Cargo.—With the approval of the Board of Trade, the facilities of the State War Risks Insurance Scheme are now extended by the following addition to the certificate of insurance:—"It is hereby agreed that this certificate of insurance shall apply to goods carried on any vessel on the British register, the within-expressed limitation to vessels insured under His Majesty's Government War Risks Insurance Scheme notwithstanding."

Standard Ships.—Sir L. C. Money, Parliamentary Secretary to the Ministry of Shipping, informed Mr. Houston in the House of Commons on Tuesday that the total number of standard ships built, completed and entered for service up to October 25, was five. The tonnage approximately was 5,200 tons gross each. One of the steamers had been lost. The number of standard ships expected to be completed between October 25 and December 31 was 18, of which 16 would be of approximately 5,200 gross tons each, one of 3,000 tons gross and one of 2,000 tons gross.

Skilled Workers' Wages Order.—A committee of the Ministry of Munitions (Sir Thomas Munro presiding) received on October 27 a deputation from Glasgow and [illegible] the Association of Engineering and Shipbuilding Draughtsmen with regard to the interpretation of the Skilled Workers' Wages Order. The deputation was informed that the Order applied to all draughtsmen employed at time rates. It was claimed that draughtsmen on the staff should be placed on equal footing. After discussion, the committee intimated that they would consider as to making a recommendation to that effect.

Tonnage Replacement.—In the House of Commons on October 24 Mr. G. Lambert asked the First Lord of the Admiralty whether he could give the House [illegible] that British mercantile tonnage was being completed at a more rapid rate than it [illegible] being destroyed by [illegible]. Dr. Macnamara, in reply, said: No, Sir. But in the course of the statement which my right hon. Friend the First Lord hopes to make within the next few days, he will deal with the whole question of the unrestricted use of the U-boat, the replacement of tonnage lost thereby, and the interdependent problems connected therewith.

Cardiff Tippers' Dispute.—At a meeting of the workpeople concerned on Sunday, a report was received of the result of an interview with Mr. [illegible] Railway Company, regarding the war bonus conversion settlement and the women's demand for a minimum wage, the women claiming [illegible] are now working. As the result of the interview an offer was made of an increase of 3s. per week in the women's wages. This offer had been accepted. With regard to the war bonus conversion, it was stated that the tippers would be entitled to the same benefits [illegible]

Reinforced-Concrete Shipbuilding at Dundee.—It is stated that Dundee will be the locale chosen for the new shipyard of the Ferro-Concrete Ship Construction Company, Ltd., recently formed for the purpose of building reinforced-concrete vessels. This company is in negotiation with the Harbour Commissioners for a suitable site with a river frontage of about 400 ft.

Shipyard Workers' Wages.—The Committee on Production, with Sir David Harrel presiding, heard, on October 23, applications for further advances of wages by the various trade unions connected with the engineering and foundry trades. The proceedings, which were private, were in pursuance of an agreement between the unions and the Engineering Employers' Federation, under which the Committee on Production are called upon periodically to consider what alteration in wages, if any, to men employed in the engineering trade is warranted by the abnormal conditions due to the war. The application was a national one on the part of the Unions for an increase of 20 per cent. in wages and a 50 per cent. curtailment in food prices.

Transport Workers' Demands.—Largely attended demonstrations were held at Cardiff, Newport and Barry on Sunday for the purpose of discussing the national after-war policy. The following resolution was adopted: "That this meeting of transport workers endorses the national programme and policy of the Transport Workers' Federation calling for the stamping out of non-unionism, the conversion of all war increases into permanent wages, the abolition of overtime, and the systematic reduction in the hours of labour. It further declares its determination to abolish cheap Asiatic labour in the mercantile marine, and demands the Government to provide suitable measures for the constitutional reconstruction of after-war industry."

Income Tax and Awards.—It has come as a matter of great surprise to those captains and officers of the merchant service who have been granted monetary awards for meritorious service in action with enemy submarines, that payment of income tax on these awards has been demanded. The matter has been raised on several occasions, and now, in replying to Mr. Basil E. Peto, M.P., the Chairman of the Parliamentary Committee of the Imperial Merchant Service Guild, the Chancellor of the Exchequer makes the gratifying announcement that the Commissioners of Inland Revenue have, with his approval, instructed the Surveyors of Taxes, with the concurrence of the various bodies of Income Tax Commissioners, that these awards should not be included in the computation of the income tax liability of the officers in question.

NEW APPOINTMENTS BY LLOYD'S REGISTER.

It is announced that Mr. T. J. Storey has been elected chairman of the Sub-Committees of Classification of Lloyd's Register of Shipping, in succession to the late Mr. Charles E. Brightman. Mr. Storey was for many years London underwriter of the British and Foreign Marine Insurance Company, of which he is now a director, and during the war has been engaged on Government work.

Mr. James Montgomerie, who was appointed principal surveyor at Glasgow in May, 1916, has now been appointed principal surveyor for Scotland, in order that he may be in a position to exercise a general supervision over the society's surveying work north of the Tweed.

Mr. F. R. Noton, at present the principal surveyor at Sunderland, has been appointed a principal surveyor on the chief ship surveyor's staff in London.

Mr. Thomas Shaw, who before the war was a senior surveyor at Barry, and whose services have since been lent to various Govern- [illegible] appointed principal surveyor at Sunder- [illegible] Noton.

Mr. D. [illegible] surveyor in the London district, has been appointed principal surveyor at the port in succession to Mr. Campbell Holms, who has recently been transferred in the same capacity to Liverpool.

Mr. W. L. Clark, who has for many years held the position of senior clerk at Liverpool, has been appointed secretary to the Liverpool committee of the society.

With a view to facilitating the work of the society in Sweden, the Committee have determined to establish a new office at Malmo, and to appoint Mr. J. W. Jorgensen, hitherto one of the society's exclusive ship and engineer surveyors at Gothenburg, to be the society's exclusive ship and engineer surveyor for Malmo and the surrounding district. Mr. Jorgensen will be succeeded at Gothenburg by Mr. [illegible] Copenhagen.

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Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Amaral, ss. (single dk.)	235 gr. 121 net	118½′ × 22′ × 8¼′ (8′ 6″)	José Ferreira do Amaral, Ltd., Lisbon, to the Vacuum Oil Co., Portugal	G. Brown & Co., Greenock (1915)	15, 32 × 24 (Ross & Duncan, Glasgow)	—
Boscombe Chine, ss. (single dk.) (ex *Hieronymi*)	2,228 gr. 1,445 net 4,100 d.w.	300½′ × 45′ × 19½′ (18′ 11″)	Boscombe Chine S.S. Co., Cardiff, to Adam Bromley & Son, London	W. Dobson & Co., Newcastle (1914)	22, 36, 60 × 39 (N.E. Mar. Eng. Co., Newcastle)	—
Brunla, ss. (single dk.)	750 gr. 395 net	198½′ × 29½′ × 12½′	Aktics. Nordsjöen, Christiania, to S. Marshall & Co., Sunderland	Akers, Mek. Værks., Christiania (1909)	16, 25½, 43 × 30 (Akers, Mek. Værks.)	—
Cornelia, ss. (single dk.)	323 gr. 194 net	143½′ × 22′ × 11½′	Eastern Shipping Co., Penang, to buyers not stated	Roy & Mitchell, Montrose (1878)	20, 36 × 24 (W. B. Thompson, Dundee)	—
Darnholme, ss. (single dk.)	3,693 gr. 2,331 net	350′ × 50′ × 23½′ (21′ 9″)	T. Smailes & Sons' S.S. Co., Whitby, to buyers not stated	R. Thompson & Sons, Sunderland (1911)	25, 42, 68 × 45 (N.E. Mar. Eng. Co., Sunderland)	—
Ellerdale, ss. (single dk.)	3,721 gr. 2,332 net	350′ × 50′ × 23½′ (21′ 9″)	T. Smailes & Sons' S.S. Co., Whitby, to buyers not stated	R. Thompson & Sons, Sunderland (1913)	25, 42, 68 × 45 (N.E. Mar. Eng. Co., Sunderland)	—
Ferngarth, ss. (single dk.)	4,629 gr. 2,899 net	380′ × 52′ × 28¼′ (24′ 1″)	Garth Shipping Co., Newcastle, to buyers not stated	Craig, Taylor & Co., Stockton (1911)	25½, 43, 70 × 45 (MacColl & Pollock, Sunderland)	Price about £125,000.
Sin-Mac (tug)	322 gr. 49 net	130½′ × 26½′ × 13¾′	Sincennes McNaughton Line, Ltd., Montreal, to buyers not stated	A. McMillan & Son, Ltd., Dumbarton (1909)	17½, 28, 46 × 30 (Muir & Houston, Ltd., Glasgow)	—

CITY OF DUBLIN STEAM PACKET COMPANY.

In the House of Commons on October 25, Mr. Clancy asked the Parliamentary Secretary to the Shipping Controller—(1) Whether two of the cargo boats of the City of Dublin Steamship Company which had been requisitioned by the Government were ordered on Monday to return on Monday from Liverpool and Manchester unloaded; if so, why; especially in view of the fact that all available tonnage is required for traffic between Irish and English ports; and whether similar orders are to be given in future. (2) Whether the cargo boats of the City of Dublin Steam Packet Company had been requisitioned by the Government and ordered to be handed over to the representative of the Ministry of Shipping in Dublin; and, if so, why the boats of this Dublin company were to be taken out of the control of their owners, who were ready to obey any orders of the Government, while the boats of the London & North-Western Railway Company, to which the City of Dublin boats were to be handed over, were left under the control of that company though requisitioned; whether the representative in Dublin of the Ministry of Shipping had intimated that he intended to appoint captains, officers and crews either from the existing staff or otherwise at his discretion; whether the Shipping Controller had contemplated the dangers likely to arise from the throwing out of employment of a large number of men with families, including men working on shore in Dublin; and whether, in view of all the circumstances, the Shipping Controller would see the advisability of dealing with the City of Dublin boats in the same way as the railway company's boats had been dealt with, and, particularly, whether he would see that the men employed by the City of Dublin Company would not suffer by any change that might be made?

The Parliamentary Secretary to the Ministry of Shipping (Sir Leo Chiozza Money), in reply, said: The City of Dublin Steam Packet Company laid up the four vessels of their fleet which were urgently required to convey cattle and foodstuffs from Ireland to England, and disregarded the orders sent to them to dispatch the vessels. The result was injury to Irish interest, congestion of the port of Dublin, delay in the transport of cattle and foodstuffs, together with loss and deterioration. In these circumstances, the only course open to the Controller was to requisition the vessels and entrust them to a management which could be relied upon to employ them promptly and in accordance with orders. Moreover, the deterioration and congestion of the perishable cargoes in Dublin necessitated the immediate return of some of the vessels without waiting for full return cargoes, at the inevitable expense of further delaying non-perishable cargoes from England. The Controller is anxious to retain the services of the officers and crews, and has at no time had any intention of throwing them out of employment. He will consider at a later date whether the management of the vessels can be restored to the owners on receiving adequate assurances that the vessels will be properly employed; but in the meantime he is bound to take measures which will put an immediate stop to the deplorable loss and injury which have been caused by the action of the company in laying up vessels.

FORTHCOMING EVENTS.

INSTITUTION OF CIVIL ENGINEERS.—Tuesday, November 6, meeting at the Institution, Great George Street, Westminster, London, S.W., at 5.30 p.m. Address by the President, Mr. Harry Edward Jones, and presentation of medals awarded by the Council.

SHIPPING SHARE MARKET.

There has been greater activity in the stock and share markets during the past week, especially in the issues of shipbuilding companies. In the shipping market Peninsular & Oriental Steam Navigation deferred ordinary has been changing hands freely at around 326, on the announcement that the company has purchased the Hain Steamship Company. The share capital of this company was largely controlled by the Hain family, which has lost by death during the past year both Sir Edward Hain (the founder of the line) and his only son, Captain Edward Hain, and the purchase of the undertaking by the P. & O. has, under these circumstances, probably been more easy in arrangement than otherwise might have been the case. The Company has considerably increased its profits in recent years, and the book value of the fleet and of investments is over £2,000,000. The shares of the Hain Steamship Company changed hands on Friday last at 34½, but it is understood that the provisional prices agreed upon for the purchase is £80 per £10 share, which will represent a payment of nearly £4,000,000 by the P. & O. either in cash or stock. An issue of the latter may therefore be expected during the next few months. Another share which is not quoted officially but is dealt in largely is the £10 ordinary share of the Pyman Steamship Company, which has advanced during the past week from 30 to 50, with frequent dealings at about 46½. The dividend has been considerably increased in late years (seven years ago no dividend was paid on the ordinary), and the interim dividend for the half-year ending November 7 is due to be announced at the end of the month. There has been some speculation in New York in the preferred and common shares of the International Marine Company, which has been reflected in dealings on this side. The preferred has risen on the announcement that a committee has been appointed to draw up a scheme for the payment of the accumulated arrears of dividend on the preferred stock, amounting to 88 per cent. This involves a payment of about $55,000,000, but it does not seem probable that it will be paid in cash. In the shipbuilding section there has been active bidding for the shares of the leading companies, and as the amount of stock on the market is very limited the demand has caused a steady hardening of the price.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
African S.S.	20	33—23½	10	6½	29	
Allan Line ... ... Deb.	100	—	4	4½	92	
Anchor Line ... Cum. pref.	10	9⅞—9½	5½	5½	9½	
Do. ... ... Deb.	Stk.	105½—102½	4½	4½	103	
Argentine Nav. ... Cum. pref.	1	19/6—11/-	Nil.	Nil.	22/9	— -/7½
Do. ... ... Ord.	1	14/6—5/6	Nil.	Nil.	16/6	[2]—2/-
Australasian Un. S. Nav. Deb.	Stk.	83½—80½	4	5	80	
Belfast Steam ... ... "A"	10 (5pd.)	—	5	5	5	
British & African Nav. Deb.	Stk.	96½—91	4½	4½	102	
British India Nav. ... Deb.	Stk.	94½—88½	4½	5½	83	
British S.S. Invest. Trust Def.	Stk.	357—190	30*	8½	355	
Do. ... ... Pref.	Stk.	108—105½	6	5⅞	104	
Do. ... ... Deb.	Stk.	79—77½	4½	6½	74	
Cairn Line ... ... Bds.	Bds.	93—88	5	5½	90½-91	
Do. ... ... Ord.	1	—	20†	9½	44 4½xd	
Clan Line ... ... Ord.	10	32½—22½	25	8½	30xd	
Court Line ... ... Ord.	£1	42/—26/-	20	13½	35/3	
Cunard SS. ... ... Ord.	1	101/—68/-	20*	5½	74/-	
Do. ... Cum. pref.	Stk.	95—89	5	5⅝	85	
Do. ... ... Deb.	Stk.	99½—93½	4½	4½	92½	
Elder Line ... ... Deb.	Stk.	97½—89½	4½	4½	103	+ -/7½
Elder Dempster ... Cum. pref.	1	20/6—18/1½	5½	6½	18/7½	
Do. ... ... Deb.	Stk.	92½—88½	5	5½	86	
Ellerman Lines ... Pref. Ord.	10	9½—9½	6½	6½	8½	
Do. ... ... Guar. pref.	10	9½—8½	4½	5½	8½	
France Fenwick ... Cum. pref.	5	98/5—92/6	5½	6½	87/6	
Furness, Withy ... ... Ord.	1	61/3—34/3	20*	9½	50/8	— 1/9
Do. ... Cum. pref.	10	9½—7½	5	5½	9	
General Steam Nav. ... Ord.	7½	12⅞—8½	15	7½	22/6	
Do. ... ... Pref.	8	7½—6⅞	6	7⅞	16/-	
Houlder Line ... Cum. pref.	5	83/9—67/6	5½	6½	80/-	
Do. ... ... Deb.	Stk.	—	4½	4½	93	
Houlder Bros. ... Cum. pref.	5	—	5½	6½	4	
Do. ... ... Deb.	Stk.	—	4½	5⅛	82	
India Gen. Nav. & Rly. ... Ord.	10	12—8½	6	5½	10½	
Indo-China N. ... Pref. Ord.	5	5 1/16—90/-	6	6½	90/-	
Irrawaddy Flotilla	40	—	15	5⅛	116	
Khedivial Mail ... ... Ord.	1	37/—10/-	25	13½	33/9	
Do. ... ... Pref.	5	77/6—60/6	5½	7½	72/6	
Do. ... ... Deb.	Stk.	94½—87½	4½	4½	95	
King Line	1	—	10*	9½	26/6	— -/1½
Lamport & Holt ... Cum. pref.	£1	20/9—18/9	6	6	19/4½	
Leyland (F.) ... Cum. pref.	10	8½—6½	5	6⅝	7⅞	
Mercantile SS. ... ... Ord.	5	18½—12	40	13	15	
Do. ... ... Pref.	1	20/1½—20/-	6	6½	15/-	
Moor Line ... ... Ord.	10	—	30	13½	22½	
Nelson Steam Nav. ... Deb.	100	98½—97½	5	5⅛	98½	
New Zealand ... ... Ord.	£10	—	8	2½	32½	
Do. ... ... Deb.	Stk.	90½—88	4	4½	89	
Nitrate Producers SS. ... Ord.	5	25½—18	30	6½	25	
Do. ... Cum. pref.	5	—	5	5	5	
Oceanic Steam. Nav. ... Deb.	100	99—95⅛	4½	4½	96	
Orient.Stm.Nav.Co. Cum. pref.	10	9½—9⅛	5	5½	9	
Do. ... ... Deb.	100	98—91½	4½	5½	89	
P. & O. S. N. ... ... Cum. pref.	100	100—91	5	5⅝	92	
Do. ... ... Def.	100	349—270	18	5½	325	
Do. ... ... Deb.	Stk.	71—69	3½	5½	63	
Prince Line	1	95/—26/-	30	7½	94/4½	+ 3/1½
R.M.S.P. ... ... Ord.	100	134⅜—97½	7	6½	112	— ⅜
Do. ... ... Pref.	Stk.	86½—76½	5	6½	81	
Do. ... ... Deb.	Stk.	88—86	4½	5⅛	89	
Shaw, Savill & Alb. Cum. pref.	5	95/—86/3	5½	5½	85/-	
Shell Transport ... ... Ord.	1	6—4⅛	35	5⅜	5½	
Do. ... Cum. pref.	10	10⅛—9	5	5½	9	
Sutherland SS. Co.	£1	69/6—41/6	30	10	51/3	
Union-Castle SS. ... Cum. pref.	10	7⅛—7	4½	6	7⅛	
Do. ... ... Deb.	Stk.	92½—86¾	4	4½	87½	
West Hartlepool ... ... Pref.	10	8½—7⅝	6½	7⅜	7⅝	

INSURANCE.

Alliance	20 (2/4 pd.)	10½—8½	12/-	7	9½	
Indem. Mutual Marine	15 (3 pd.)	13½—9½	15/-	5	20½	
London Assurance	25 (12½ pd.)	52½—42½	20	6	57	
Marine Insurance	25 (15 pd.)	36½—33½	45/-	6	55½	
Merchants' Marine Insurance ...	10 (2½ pd.)	7½—7 1/3	10	6	9⅓	
N. British & Mercantile ... Ord.	25 (6¼ pd.)	34½—29	40/-	6½	34½	— ½
Phœnix Assurance	10 (1 pd.)	7½—5¼	10	7	7⅛	— 1/8
Reliance Marine	10 (2 pd.)	—	20	4½	7½	
Royal Exchange Assurance ...	Stk.	189½—181	10	5½	230½	— 1½
Sea Insurance	10 (2 pd.)	19½—19½	10	6	27	
World Marine, Limited ...	5 (2 pd.)	6 1/3—3 5/7	5	4½	6½	

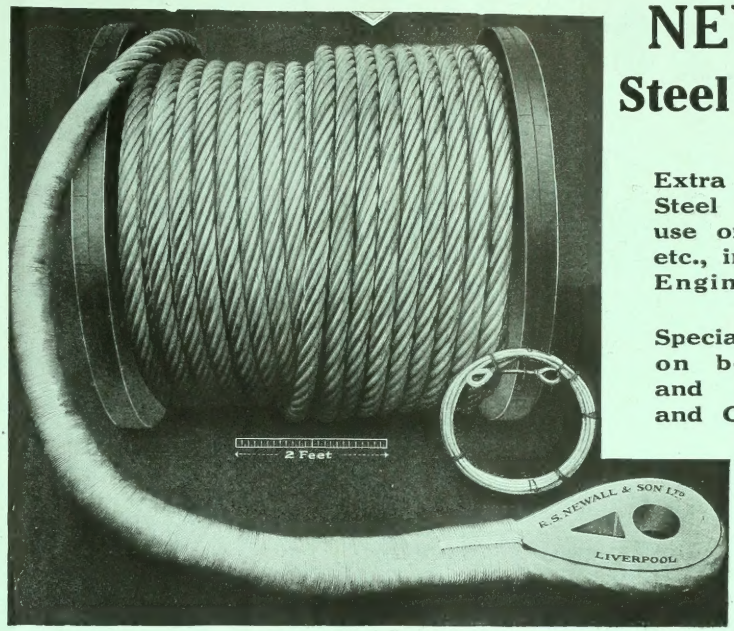
IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
Babcock & Wilcox... ... Ord.	1	64/6-47/10½	15	4⅜	63/6	—1/6
Baldwins ... Cum. pref.	1	1½—1	5½	5⅜	19/9	— -/3
Do. ... ... Deb.	Stk.	87⅜—86¼	4½	5⅜	84	
Bayliss, Jones ... Cum. pref.	1	—	5	7½	11/4	
Bell Bros. ... ... Cum. pref.	10	10 3/16—9 7/8	6	6½	9¾	
Do. ... ... Deb.	Stk.	89—78⅝	5	6⅜	78⅝	
Bessemer (Henry) ... ... Ord.	1	29/—26/-	12½	8½	29/9	
Bolckow Vaughan ... ... Ord.	1	25/10½—18/-	11	8	26/10½	
Do. ... ... Cum. pref.	20	1⅜—18	5	5⅜	17	
Cargo Fleet Iron ... ... Ord.	1	23/3-13/10½	3	3½	22/6	—1/-
Do. ... ... Deb.	100	86½—84	4½	5⅜	83	
Consett Iron Co. ... ... Ord.	1	89/4½—65/3	50	11½	89/6	
Dominion Iron & Steel	Bds.	83—78	5	6⅜	76	
Dorman, Long ... ... Ord.	1	36/—22/3	14	9	43/-	
Do. ... ... Deb.	Stk.	97⅜—97	4	5½	73	
Ebbw Vale Steel & Iron Ord.	1	28/7½—19/-	12½	9½	27/3	+1/-
Guest, Keen & Nettefds Ord.	1	71/3—60/-	15*	3½	80/-	
Do. ... ... Cum. pref.	5	5¼—5⅛	5	4½	5⅜	— ⅛
Do. ... ... Deb.	Stk.	82½—80⅜	4	5½	79	
Hadfield's Steel Foundry Ord.	1	82/6—69/-	30	6	100/-	
Ibbotson Bros.	5 (4 pd.)	8—6	7½	4½	6¾	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	9—8	15*	7½	9	
Lanarkshire Steel ... Cum. pref.	10	—	5	7⅛	7	
Lysaght (J.) ... Cum. pref.	1	22/7½—20/3	6	6	20/-	
Do. ... ... 2nd pref.	1	21/1½—21/-	6	6	20/-	
Manganese Bronze ... Ord.	1	—	6	11	1 1/16	
Do. ... ... Cum. pref.	1	—	6	8	1/2	
North-Eastern Steel ... Deb.	Stk.	—	4½	—	—	
Palmers Ship & Iron "A" ...	1	12/6—9/-	Nil.	Nil.	10/9	
Scott (Walter) ... ... Ord.	1	26/3—17/9	15	12	25/-	
Do. ... ... Pref.	1	18/10½—16/3	6	7½	19/-	
Sheffield Forge	1	—	15	7½	69/-	
Shelton Iron & Steel ... Ord.	1	20/4½—15/-	7½	8½	21/-	
Do. ... ... Deb.	100	94—92½	5	5½	91½	
S. Durham Steel & Iron ... Ord.	1	37/6—27/-	10	6⅝	40/3	+2/9
Do. ... ... Cum. pref.	1	21/—19/-	6	6½	20/-	
Do. ... ... Deb.	Stk.	82—80	4½	5½	80	
Steel Co. of Scotland ... Ord.	10	—	10	10	12/1/-	
Stewarts & Lloyds Pref. ord.	10	18½—17	10	6½	16	
Do. ... ... Cum. pref.	10	—	6	4⅜	13½	
Stone (J.) ... ... Cum. pref.	10	—	5	6½	8	
United States Steel ... Ord.	100$	144⅞—83½	8	7⅛	107⅞†	
Do. ... ... Cum. pref.	100$	128⅝—112¾	7	5½	118¾†	
Vickers Ltd. ... ... Ord.	1	40/3—33/6	12½	6½	39/6	+ -/3
Do. ... ... Pref.	Stk.	93—85	5	6	83	
Do. ... ... Deb.	Stk.	83—75	4	5 3/16	79	
Weardale Steel ... Def. ord.	1	31/—19/1½	19½	13½	30/-	+1/-
Do. ... ... Cum. pref.	1	23/6—17/6	6	5	24/-	— -/6
Do. ... ... Deb.	Stk.	70¾—69¼	4	6	83	
Workington Iron & Steel Ord.	1	24/3—14/3	10	7½	25/7½	— -/4½

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth ... Ord.	1	45/—34/6	12½	7	39/6	+ -/6
Do. ... ... Cum. pref.	5	78/—67/6	4	5⅞	70/-	
Do. ... ... Deb.	Stk.	80½—75	5	6⅛	77	
Beardmore (W.) ... ... Deb.	100	99—92	4½	5	91	
Brown (John) ... ... Ord.	1 (15s. pd.)	27/3—20/6	12½	8⅝	27/-	
Do. ... ... Cum. pref.	10	10—5⅛	5	5⅞	8¾	
Cammell Laird ... ... Ord.	5	7—98/-	10	8	6⅝	
Do. ... ... Cum. pref.	5	88/—76/3	5	6⅞	82/6	
Do. ... ... Deb.	100	93½—85	4½	5½	81	
Dunlop (Jas.) ... ... Ord.	1	19/7⅛-13/4½	10	10½	18/6	
Do. ... ... Cum. pref.	1	17/1½-16/4½	6	7⅛	17/6	
Fairfield Shipbldg. Cum. pref.	10	8⅝—8 1/16	6	7½	8⅜	
Fleming & Ferguson ... Ord.	10	—	10	7	14⅝	
Gray (Wm.) ... ... Deb.	100	100¾—99¼	4½	4½	100⅝	
Hawthorn (R. & W.) Leslie Ord.	10	15⅝—14	12½	5⅝	23	
Henderson (D. & W.) Cum. pref.	1	—	5	9	5/8	
Richardsons Westgarth ... Ord.	1	7/9—2/10½	Nil.	Nil.	6/4½	— -/1½
Do. ... ... Cum. pref.	1	15/7½—8/-	Nil.	Nil.	16/3	+ -/3
Do. ... ... Deb.	Stk.	69—67½	4½	6⅛	65	
Simons (W.) ... ... Cum. pref.	10	—	5	5	9½	
Swan, Hunter & W. R. ... Ord.	1	35/6—26/-	12½	6½	43/6	+1/-
Do. ... ... Cum. pref.	1	18/9—17/-	5	5⅛	17/-	
Do. ... ... Deb.	Stk.	82—80¾	4½	5½	78	
Thornycroft (John I.) ... Ord.	1	38/9—21/9	17½	8½	39/6	— -/6
Do. ... ... Cum. pref.	1	18/6—16/3	6	6½	17/6	
Do. ... ... Deb.	100	99½—88	5	5⅞	84	
Wallsend Slipway ... ... Ord.	1	2—1⅛	10	5	2	
Do. ... ... Cum. pref.	1	1—1	5	5	1	

* Including bonus. † Also 20 % in shares. ‡ Treasury price.



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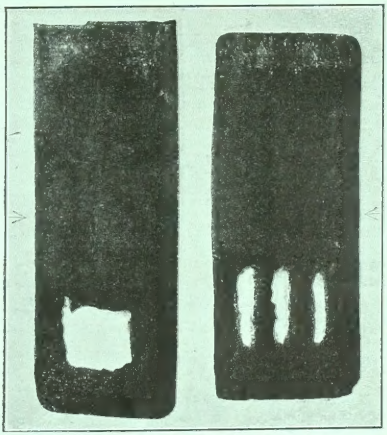

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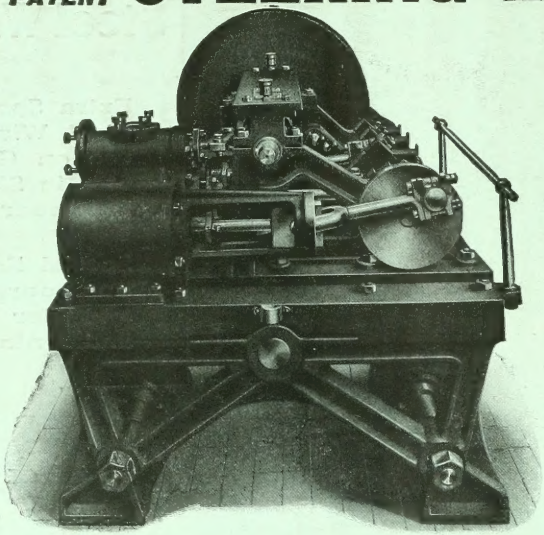

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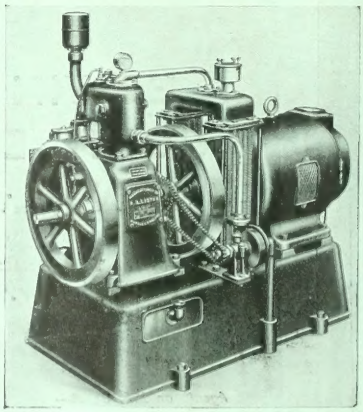

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